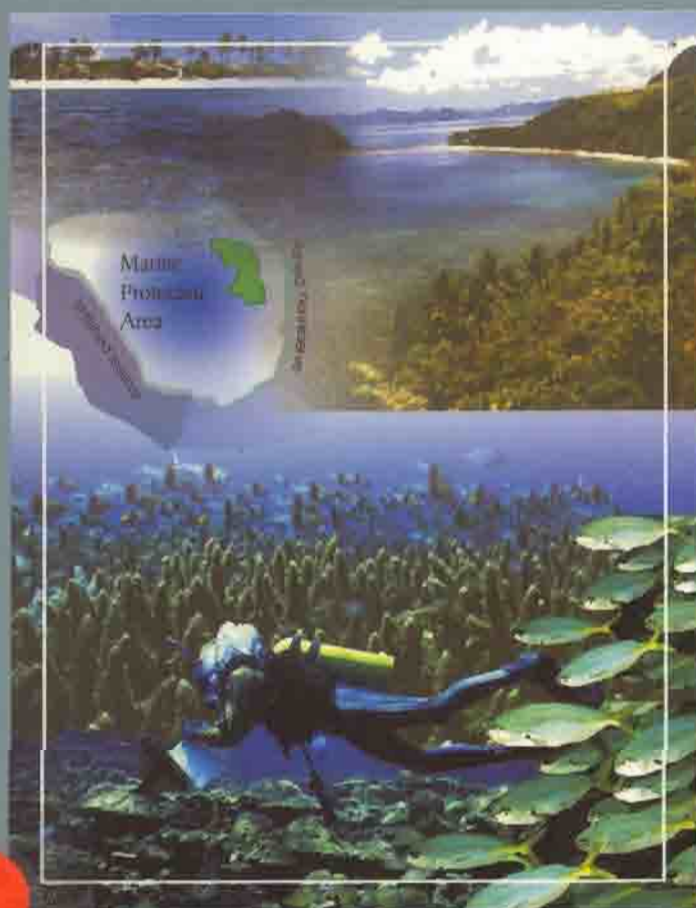


A Framework for Future Training in Marine and Coastal Protected Area Management



Edited by

John W. McManus

Carien van Zwol

Len R. Garces

Dianeetha Sadacharan

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Coastal Zone Management Centre
The Netherlands



International Center for Living Aquatic
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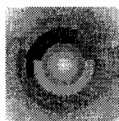
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**COASTAL ZONE MANAGEMENT CENTRE
THE NETHERLANDS**

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**A Framework for Future Training in Marine
and Coastal Protected Area Management**

NOV 16 1998

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in Marine and Coastal Protected Area Management
Manila, Philippines
3-7 November 1997

Edited by
John W. McManus, Carien van Zwol, Len R. Garces and Dianeetha Sadacharan

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10 Nov. 1998

Foreword

Marine and coastal protected areas (MPAs) play a critical role in the conservation of biodiversity and, hence, provide a mechanism for the Parties to meet the commitments called for by the UN Convention on Biodiversity (CBD), the UN Law of the Sea, Chapter 17 of Agenda 21 and several other international agreements. The Jakarta Mandate (1995), which outlines the program of action for marine and coastal biodiversity within the CBD, identifies the establishment of MPA as one of the five thematic areas for implementation of the convention. The effective management of MPAs to ensure that they meet their declared objectives poses many challenges. The need to take steps to rectify shortfalls in the management of MPAs has been stressed in the recent report on MPAs by the World Bank, IUCN and the Great Barrier Reef Marine Park Authority. At the first meeting of experts on Marine and Coastal Biodiversity, held in Indonesia in 1997, a three-year work program to implement the Jakarta Mandate was outlined. The meeting endorsed that regional and national training courses for capacity building in marine and coastal protected area management should receive high priority in the work program. This proposal led to the organization of a Workshop on a Framework for Future Training in Marine and Coastal Protected Area Management by the Coastal Zone Management Centre under the The Netherlands Government Programme to support the implementation of the CBD.

At the workshop, the participants identified future training needs and optimal training approaches to meet the growing need for skilled MPA personnel, defined means of strengthening existing training capacities and explored possibilities for curricula and training materials development. They acknowledged that capacity building requires long-term commitment and stressed that MPA capacity building should progress from being isolated, project-related efforts to more sustainable programs implemented on a long-term basis.

This volume provides an overview of the training needs and existing capacities on a regional basis, and sets priorities for MPA training activities. I hope that the international community and national policymakers will benefit from the framework for training of MPA personnel outlined in this document, in directing future investments in capacity building and guiding MPA training initiatives to best meet the identified training needs of the regions.

Luitzen Bijlsma
Managing Director
Coastal Zone Management Centre
The Netherlands

Acknowledgments

The Workshop on a Framework for Training in Marine and Coastal Protected Area Management was the result of the efforts of many individuals. The resource persons, Brian Crawford, Simon Woodley and Joop de Schutter, contributed significantly by preparing background papers and guiding the regional working group discussions. We thank all the participants for taking time from their busy schedules to participate in the workshop and putting in hours of hard work, especially during the long working group discussions. These discussions resulted in regional working group reports and facilitators' reports, which constitute the cornerstone of this volume.

The Directorate General of International Cooperation of The Netherlands Ministry of Foreign Affairs provided funding for the workshop under the Dutch Program for International Nature Conservation.

The workshop was organized in cooperation with the International Center for Living Aquatic Resources Management (ICLARM) which provided both technical and logistic support. We thank the ICLARM staff, and especially Rosenne Funk, Zaida Alojado and Kristine Santos, for their untiring efforts to ensure a successful workshop.

Finally, with much sadness, we acknowledge the assistance of our former colleague, the late Peter Gunther, in coordinating the logistics, travel and administrative details prior to the workshop.

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The Netherlands

Carien van Zwol
Coastal Zone Management Centre
The Netherlands

Executive Summary

Marine protected areas (MPAs) are of growing importance globally as practical and potentially effective options for the management of fisheries, the protection of biodiversity and the generation of income from ecotourism. This workshop report addresses the need to train those who would develop and manage MPAs throughout tropical seas.

MPAs vary in size—from small reserves of less than a square kilometer to management systems covering hundreds of thousands of square kilometers. Small fishery reserves are increasingly identified as crucial elements of integrated coastal management in developing countries. Small reserves have very high potential for broad and rapid proliferation, particularly in areas where bottom-up (as opposed to top-down) coastal management is common, such as among coastal communities in the Pacific and parts of Southeast Asia. **The widespread establishment of small reserves seems particularly promising, and can be facilitated through simple 'best practice guides' for developing MPAs in the absence of specialists.** However, such reserves will not be sufficient to protect fisheries and biodiversity, and, therefore, it is important to protect species requiring varied habitats and/or large foraging areas. For this and other reasons, systems of small, municipal-level reserves should be supported by large reserves at strategic locations. These will generally be maintained at provincial or national governments. At all scales of MPA implementation, the strong support of policymakers and the general public is required. Thus, the training required to catalyze widespread and effective use of MPAs ranges from the dissemination of simple principles through public schools and mass media, to formal courses for professionals involved in the design and management of large MPAs.

MPAs and MPA training opportunities are both more common in Southeast Asia and the Pacific than in the Caribbean, South Asia and East Africa. Nowhere do the training opportunities meet the demand for them, and there is a general need for well-developed training materials and curricula. A common problem is that current MPA managers have often come from forestry or wildlife management, and may have little or no training about marine ecosystems or coastal management. Training is needed both in general aspects of the marine and coastal environments, as well as in planning, management and enforcement. In particular, there is a need to reduce dependence on project-related MPA training and to increasingly support the institutionalization of the training. **In addition to the incorporation of courses into existing schools, the development of regional training centers is recommended.** An example is given of a proposed "Regional marine protected area training initiative (REMPATI)" for Southeast Asia.

The total area of MPAs in the world is several orders of magnitude below levels that would provide optimal benefits. Furthermore, many existing MPAs are "paper parks" which exist in terms of legislation, but have been poorly implemented or not implemented at all and fail to provide effective environmental protection or other long-term benefits. Internationally, there have been calls to establish MPAs covering 20% of the world's oceans by the year 2020. The establishment of a strong program of MPA training throughout the tropics will be a crucial step toward the widespread, effective implementation of MPAs and the sustainable management of the world's marine ecosystems.



Part I. Workshop Overview

Background

Marine and coastal protected areas (MPAs) are recognized as a practical way of conserving marine biodiversity, maintaining productivity of marine ecosystems, and contributing to the economic and social welfare of human communities—three critical requirements for sustainable development of coastal and marine areas. MPAs also play a key role in the implementation of several international conventions. In the Jakarta Mandate (1995), the program of action for marine and coastal biodiversity under The Convention on Biological Diversity (CBD), MPAs are one of the five selected themes for the implementation of CBD. At the first meeting of experts on Marine and Coastal Biodiversity (1997), regional and national training courses for capacity building in MPA management were identified as a high priority in the proposed three year work program. In addition, Integrated Marine and Coastal Areas Management was recommended as the umbrella for the implementation of the initiatives with respect to Marine and Coastal Biodiversity. Other relevant international conventions on MPAs include Ramsar which aims to stem the progressive encroachment on and loss of wetlands; Chapter 17 of Agenda 21 for which the Action Plan specifically requires that states should identify marine ecosystems exhibiting high levels of biodiversity and productivity and other critical habitat areas, provide necessary limitations on their use, and properly manage these areas through *inter alia* designation of protected areas; and The Framework for Action of the International Coral Reef Initiative which calls for similar measures to protect coral reefs and related ecosystems.

The availability of skilled personnel is fundamental to the success of establishment and management of MPAs. Increase in funding for MPAs and other support will be ineffective unless the pool of personnel

available for MPA management expands rapidly. The report titled '*A Global Representative System of Marine Protected Areas*' compiled by the Great Barrier Reef Marine Parks Authority, the World Bank and the World Conservation Union stresses that training and development of national capacities for management of MPAs within the framework of ICZM are a fundamental imperative and countries and regions should be self-reliant in meeting their own training needs. International support aimed at developing capacity for MPA management should focus on the development of training skills within countries and within regions.

To date training in MPA management has consisted of site-specific efforts which are part of the scope of specific MPAs. Regional training opportunities have been limited and there has been no substantive effort to define training needs or strategies. Therefore, guidance on how to optimize future international training initiatives is an immediate priority. This will require identification of existing training capacities and future training needs, existing training tools and techniques, and curriculum development needs. Possibility of regional arrangements for training should be explored. Effective management of MPAs will require collaboration between countries to address common problems. Specific regional priorities and problems can be better addressed within a regional context. Regional programs or conventions such as the Regional Seas Programme provide a framework for developing regional management strategies. Moreover, it is necessary to integrate ecological objectives, ecosystem approaches and biodiversity conservation into regional planning.

Objectives and Activities

The Workshop on Framework for Future Training in Marine Protected Area was organized by the Coastal



Zone Management Centre (CZMC), the Netherlands, and the International Center for Living Aquatic Resources Management (ICLARM), Philippines. It was conducted on 3-7 November 1997 in Manila, Philippines, with funding from the Netherlands Ministry of Foreign Affairs, Directorate General of International Cooperation, through the Dutch Programme for International Nature Conservation.

The objectives of the workshop were to:

- identify training needs and optimal training approaches and strategies;
- assess existing training capacities within the regions and identify lack of capacity;
- review existing materials and curricula, and identify needs for additional material; and
- identify opportunities for cooperation and partnership with regional programs.

These objectives were accomplished through discussion papers and working group discussions in five sessions. The sessions included: (1) identification of training needs, assessment of existing capacity, approaches and strategies for optimal use of available resources; (2) recommendations for curricula, training materials and tools; (3) role of MPAs in biodiversity conservation; (4) opportunities for cooperation with regional programs for future implementation of training programs; and (5) building training capacities in the regions. Details of the workshop program are given in Appendix 1.

A total of 35 representatives from various interna-

tional/regional institutions, national agencies and nongovernmental organizations (NGOs) participated in the workshop. A list of the participants and their institutional affiliations are given in Appendix 2. Among the participants, there were 13 national representatives, six from national/regional organizations, three from international organizations, four from NGOs, two from CZMC, three from ICLARM, three resource persons (from the University of Rhode Island, Great Barrier Reef Marine Park, and Coastal Zone Management Consultant Resource Analysis) and a representative from the Royal Netherlands Embassy. During the working group discussions, the participants were divided into four regional working groups: Southeast Asia (plus North Pacific), South Pacific, Caribbean, and East Africa and Western Indian Ocean.

Main Results

Training programs on MPAs are limited but some training have been conducted as part of Integrated Coastal Zone Management (ICZM) programs or as site-specific efforts within specific MPAs. There is a need to develop a core of trainers and to design programs at different levels (i.e., park managers to policymakers). In developing training modules, materials and tools, it is important to consider the regional or national context to enhance their effectiveness. Internships and study tours can also enhance understanding of MPAs. The conclusions of the main workshop and recommendations from the five sessions are summarized in Box 1.

Box 1. Main workshop conclusions and recommendations.

Assessment of the Need for Training

- Lack of skilled personnel is a key reason for the low level of management in many MPAs.
- Training capacity varies widely among the regions but is, in general, insufficient to meet current demands. Demand for trained MPA personnel will expand significantly in the coming years as a result of the efforts to increase the numbers of MPAs worldwide.
- The opportunities for MPA-specific training are limited primarily to *ad hoc*, project related efforts. Some ICZM training programs do include components on MPAs.
- There are significant differences in the number and size of MPAs and their management structures among countries and regions. Therefore, it is necessary to consider the local, cultural and social contexts as well as the scale of MPAs in designing training programs.

continued

Box 1 continued

Training Approaches and Strategies

- Well-designed training programs targeted at different levels of management are needed. Both introductory and intensive courses are required.
- To meet the increased demand for training, 'Training of trainers' programs at the regional level was considered a useful approach. This will develop a core group of trainers, who then become the vanguard for training others.
- Internships, study tours and refresher courses should be part of a regional MPA training program.
- Regional networking should be strengthened to promote exchange of experiences and discussion of issues relating to MPA management.
- A mechanism for evaluating the effectiveness of training programs should be established.

Curricula Training Materials and Tools

- Availability of training material is limited and emphasis should be placed on development of training modules and training tools.
- In developing training modules, materials and tools, it is important to consider the 'regional/country' context and local case studies should be included.
- Training modules recommended by the regional working groups show a high degree of commonality but indicates that, on a more detailed level, the content has to be region/country specific and based on sound training needs assessment.
- The importance of management skills and the need to include development of management skills in the curriculum was emphasized.
- While developing training programs, attention should be given to the considerable regional differences in the responsibilities of senior and middle level managers to be addressed and their educational background.
- A networking mechanism should be established to compile and distribute existing training materials.

Building Training Capacity

- Building training capacities requires long-term commitments, but is a prerequisite for ensuring self-sufficiency in meeting the training needs of the region.
- There are several academic programs that have the potential of incorporating MPA training on demand. In addition, there are accredited NGOs in some regions capable and willing to implement training programs.
- The training capacities of these institutions can be strengthened through more effective networking and sharing of materials, human resources and experiences within the region.
- Regional institutions and other organizations which can coordinate and implement training programs within the regions should be strengthened.

Sustaining MPA Training

- There is a need to identify long-term funding sources and sustainable mechanisms to ensure the continuity of regional and national MPA training.
- Donors and in-country policymakers need to be sensitized to place more emphasis on institutionalization of training within the country and to provide the necessary resources on a long-term basis.

Part II. Synopsis of Workshop Sessions

Session 1: Identification of Training Needs, Assessment of Existing Capacity, Approaches and Strategies for Optimal Use of Available Resources

Facilitator: Brian Crawford

The session started with a paper presented by Simon Woodley of the Great Barrier Reef Marine Park Authority entitled "Overview of Training Needs, Strategies and Approaches for Marine Parks Personnel". The paper outlined a general framework for training MPA managers. It provided a range of concepts, approaches and strategies that can be used for designing and implementing such programs. It included a definition of management which can be defined broadly or narrowly based on the local context. It noted the range of people who may need training, including government personnel, NGOs, private sector groups and communities. The paper listed a range of knowledge, tools and personnel skills MPA managers typically need and emphasized that training is directed at changing behavior to improve personnel and organizational performance. Mr. Woodley stressed the need to prioritize training needs, as the range of potential training is great and resources for training (financial, time and personnel) are always limited. The paper stressed the importance of setting goals and objectives for training, and the need to distinguish between training outputs and outcomes. It noted that the local cultural and social context as well as the scale of MPA areas needs to be considered in the design of training programs. While general concepts and terms need to be presented and defined, they also need to be grounded in practical examples so participants can apply them in their work. The paper concluded with recommendations for a range of principles and strategies to consider for MPA training.

The presentation was followed by a large group discussion. A question that was asked was how to get policymakers to support MPA programs. Recommendations included the use of 'godfathers' influential and respected individuals who support and understand the benefits of MPAs—to communicate concerns and provide advice to policymakers and politicians. Another suggestion was to show policymakers the reality on the ground—as concrete experience often has more impact than abstract conversations.

Another point made was the need to consider MPAs in the broader context of ICM which may require involvement of related sectors in MPA training programs. Differences of resource availability (of the management institution), national population and size of government also need to be considered. MPA managers need to grab people's attention to support management initiatives. It was also pointed out that changing behavior is difficult and takes time.

It was recommended that donors need to be sensitized to place more emphasis on the institutionalization of training as opposed to the abundance of project-driven training. Study tours for 'godfathers' and policymakers may not lead to commitments for action by them. Hence, it was suggested that study tour objectives require commitments for action before returning home. The issue of the role of communities was also raised, stressing the need to involve communities in the management process and in pressuring the politicians to make commitments for action. It was stressed that people can make a difference. The economic and social benefits of MPAs should be more widely publicized to obtain greater support for them. While MPAs stress the marine environment, managers need to be involved in considering the human aspects as most of the people with major impact on coastal zones live on land and are not typically part of the protected area. Suggestions were made that MPA training include:

- how to deal with people living in and using the MPA;
- income generating opportunities for people;
- knowledge of ecotourism benefits and impacts; and
- development of social skills (as biodiversity is not the problem while generally 'people' are).

Lastly, it was suggested that a database of training institutions and opportunities be established and maintained.

Prior to regional group discussions, a joint presentation was made by ICLARM. Len Garces presented a summary of the questionnaires which was distributed to the workshop participants. Dr. John McManus gave a short presentation on "MPA Training Needs: Scales and Target Populations". It was pointed out that some

experts advocate up to 20% of marine areas be set aside as MPAs, though less than 1% are presently set aside. To reach the 20% goal, a large number of additional MPAs need to be developed. Most of the existing MPAs are small (1-100 km²) and most managers of the small MPAs have only a high school education. The potential demand for training is enormous.

Regional working groups were given several hours for answering a series of questions (Box 2).

Each group made short presentations of group discussions and outputs the following day. While there is great diversity within and among the regions, several themes were evident. In most cases, MPA managers are trained as foresters or wildlife specialists and only in a few cases do they have a marine educational background. They are usually high school graduates and sometimes college graduates. Training needs

Box 2. Guide questions for Session 1 working group discussions.

Assessment of Training Needs and Current Capacity

1. What are the needs for your region with respect to MPA training?

(Place emphasis in your discussions on the needs of mid-level park managers but also discuss needs for senior managers as well as field staff and park rangers.)

Consider:

- How do the needs vary depending on the size of the MPA or the level at which it is managed (e.g., municipal marine sanctuary versus national park)?
- For which groups of personnel?
Which tools/concepts, skills and knowledge are important for various groups?

Prioritizing Your List of Needs

2. What is the existing capacity for training managers in your region?

Consider :

- What institutions are currently providing training on a regular, *ad hoc* or project related basis?
- What courses or other forms of training are available and at what level?
- Are there in-house training programs by MPA institutions? If so, what are the experiences with those?
- What is the current curriculum emphasis?
- To what extent are the trainers local or from within the region, and to what extent are they from outside the region?
- What are the priorities and gaps with respect to the needs?

Training Approaches and Methods

1. What are the current approaches and methods used for training (e.g., intensive courses, on-the-job training, internships or mentoring programs) in your region?
2. Assess how appropriate these approaches are—what works and what doesn't work, and why?
3. What is implemented at the regional versus national or subnational levels?
4. What is appropriate for implementation at the regional, national or subnational level?

include an orientation to the marine environment and general aspects of planning, management and enforcement. In the Caribbean, East Africa, Western Indian Ocean and many countries in Southeast Asia, planning and establishment of MPAs has been through a top-down approach, whereas in the South Pacific and some areas of Southeast Asia such as the Philippines a bottom-up approach is being utilized. Regardless of the planning approach used, mobilization and involvement of the community is an important skill area and training need for MPA managers. In Southeast Asia, alternate livelihoods for people living in parks utilizing unsustainable use practices is also important.

The types of senior and mid-level managers vary considerably. In the South Pacific, senior level managers are Village Chiefs, whereas in Kenya and Southeast Asia, they are Directors, Assistant Directors, Director Generals or Ministers. At present, the number of MPA managers is limited. In Kenya, for example, there are only nine area managers and marine park managers while in the Seychelles, there is only one marine park officer and one assistant park officer. If community-based MPAs are included in our definition of MPA managers, then there are over 50 in the

Pacific and more than one hundred in the Philippines.

Most training courses currently offered tend to be *ad hoc* or project driven and examples of ongoing MPA training courses are hard to find. An exception to this is the Kenya Wildlife Service Training Institute which has recently added several training courses directed at MPA managers and rangers in addition to their terrestrial training offerings. Southeast Asian and the Pacific countries tend to have a large number of people and institutions involved in different aspects of MPA management and training. The Caribbean, East Africa and Western Indian Ocean regions have few.

General recommendations include the development of training modules and materials, strengthening regional networking, training of trainers, study tours, internships, as well as strengthening national and regional institutions which may be able to provide the training programs.

It is likely that the demand for well-trained MPA managers will increase as more and more protected areas are established. A declared protected area is not protected unless it is well managed. 'Paper parks' are common. Hence, it is obvious that there is a great need for training in this field.

Session 2: Recommendations for Curricula, Training Materials and Tools

Facilitator: Hansa Chansang

Joop de Schutter presented the introductory talk on "Recommendations for Curricula, Training Materials and Tools", reviewing important elements such as the objectives of marine and coastal protected areas, criteria for selection, training and planning, comparison of existing training modules with a proposal for a new structure and suggestions on planning and monitoring tools including role plays.

This was followed by discussions in regional working groups and presentations of those group discussions.

All four working groups identified four broad areas for training: basic knowledge on the marine ecosystem; management skills both in general and specific; marine protected area management; and management tools. However, there was considerable diversity among the regional working groups in the design of the specific modules.

The target groups for training also varied but there was emphasis on mid-level managers. It was noted that the types of mid-level managers vary according to the type of MPA and the educational background of mid-level managers also vary in the regions as presented in working group reports. Box 3 summarizes the formulation of training modules designed by various regions. The four regional working group identified materials available that can be useful for training. However the lists are not comprehensive because of the limited time frame of the workshop.

Box 3. Summary of formulation of training modules by the regional working groups.

Region	Module 1	Module 2	Module 3	Module 4	Module 5	Module 6	Target Group	Duration
Southeast Asia	Our assets	Management planning and implementation	Tools and techniques	General management skills	Teaching skills		Mid-level managers (in-country trainer)	3-month intensive course, 3-month internship
East Africa and Western Indian Ocean	Selecting criteria and problem analysis	Sociopolitical issues and legislation	Marine ecosystem	MPA management and planning	Implementation and monitoring	Park implementation and communication skills	Mid-level managers, field staff	8 weeks
Caribbean	Coastal and marine managers	Participation planning	MPA management and planning	Management skills	Monitoring of resources and uses		Senior/mid-level managers, field staff	8 weeks
South Pacific	Introduction to management of marine environments	Community-based management	Introduction to marine ecosystem and relevance to management	Organizational management skills	Tools for MPA management		Mid-level managers (conservation area support officers)	28 days for introductory courses; 12-14 weeks for advance courses and distance education

Recommendations were made for comprehensive compilation of available materials for several regions. It was noted that there was no formalized training courses and materials for MPA managers in these regions except for Southeast Asia which was produced by UNEP and has not been fully utilized. Suggestions were made for the preparation of training manuals as well as materials and teaching tools such as video and computer software.

Recommended actions were generally similar among the working groups. The need for development of training materials and modules were stressed. Where possible, development of new modules should

build on existing training materials and modules. There is a need to compile existing training materials and tools to establish a network within the region. It was recommended that a suitable institution and/or network of institutions be appointed to implement the training programs, a reference group be established to monitor the outcome of this workshop and refresher courses and/or other methods be developed to evaluate the effectiveness of training programs. The Southeast Asian group recommended a regional training program to train trainers in MPA management.

Session 3: Role of Marine Protected Areas and Biodiversity Conservation

Facilitator: John W. McManus

A field trip to Anilao, Batangas, southwest of Manila, was conducted for this session. The participants had an opportunity to swim/snorkle on a reef flat in the mid-morning and Dr. John McManus gave a lecture-discussion in the afternoon (see Discussion Pa-

per 4 in Part III). Dr. McManus gave a background on global biodiversity patterns which show high diversity in the tropics, especially in Southeast Asia. Causes of degradation of coral reefs and the concept of over-fishing were discussed. The need for establishing MPAs with a mixed strategy of single large or several small (SLOSS) MPAs was noted. A global call to set aside 20% of the world's marine waters as reserves by the year 2020 was also emphasized. The establishment of large reserves covering thousand of kilometers of ocean and coastal waters will require setting of priorities and establishment of criteria for reserves.

Session 4: Opportunities for Cooperation with Regional Programs for Future Implementation of Training Programs

Facilitator: Muliagatele Iosefatu Reti

Representatives from the World Bank, the Asian Development Bank (ADB) and the Intergovernmental Oceanographic Commission (IOC) discussed some of the projects relating to the marine and coastal environment undertaken or sponsored by them.

Participants were particularly interested in how to access resources from the Global Environment Fund (GEF) of the World Bank and the process for putting proposals through. The need to disseminate more information on the GEF was identified.

ADB has already funded a number of coastal zone management projects in the region. A number of other projects are in the pipeline. Participants were invited to find out more about the work of ADB and the projects it has supported from its World Wide Web site.

The Global Coral Reef Monitoring Network, The Man and Biosphere Programme (MAB) and the Environmental and Development in Coastal Regions and Small Islands (CSI) are some of the projects UNESCO has been supporting worldwide through the IOC. UNESCO's primary role is one of coordinator, promoter and facilitator. However, it also provides some funding for small projects.

Also stressed in this session were the need to sustain MPA training through long-term funding sources and to institutionalize training programs within the countries and national institutions.



Session 5: Building Training Capacities in the Regions

Facilitator: Alida Ortiz

Presentations from the four regions represented at the workshop (Southeast Asia, East Africa and Indian Ocean, Caribbean, and South Pacific) noted a broad spectrum of relevant training capacities. These can be found in universities, government agencies and NGOs. The different types of training programs were also noted. Graduate studies in coastal resource management are offered in the Philippines (University of the Philippines, Marine Science Institute - UPMSI), Australia (International Tropical Marine Resource Centre - INTROMARC) and Thailand (Asian Institute of Technology - AIT). These academic programs have the potential for producing short training courses on MPA management at short notice.

There are also accredited NGOs in the regions capable and willing to undertake training programs for MPA management. Some of these NGOs were present at the working group discussions. In Southeast Asia,

these included Coastal Resources Institute, Thailand (CORIN); ICLARM, World Wildlife Fund (WWF), Philippines; and the Haribon Foundation. The Coastal Resource Institute (CRC) of the University of Rhode Island, USA, has implemented training for trainers programs for integrated coastal management in East Africa and the Indian Ocean. The Consortium of Caribbean Universities for Natural Resource Management (CCUNRM) and Caribbean Natural Resources Institute (CANARI) serve the Caribbean Region. The South Pacific Regional Environment Program (SPREP) as an intergovernmental agency does the same in the South Pacific. These organizations have developed training activities in coastal zone management that may be applied and adopted to MPA management.

The training capacities of these institutions can be strengthened through more effective networking—sharing materials, human resources and experiences within the regions. The funding of training projects through regional institutions will contribute to their long-term impact in the regions.

Based on their needs and capacities for MPA management training, the regional groups proposed

basic projects that will fill the objective of training personnel and strengthening the training capacity of their regional organizations. For example, the work-

ing group of Southeast Asia proposed an initiative for a Regional Marine Protected Area Training (see Box 4) for possible funding.

Box 4. Regional marine protected area training initiative (REMPATI - ASEAN).

Background

Recognizing that there is an urgent need for enhancing the capabilities of MPA personnel in this region and that existing 'project type' programs in the region have not been able to fulfill the above need, the group strongly feels that a regional marine protected area training program be developed. The organization structure, networking, functions and program schedules are proposed below. The group also proposed channels for seeking future support.

Proposed Organizational/Networking Structure

REMPATI - ASEAN will have the following personnel:

- Coordinator
- Secretary
- Experts (Trainers)

REMPATI will perform the following functions:

- Training of trainers in classroom, laboratory, field internship in different environments
- Serving as a clearing house and network center for MPA programs in this region

Proposed Schedule of Activities

Year 1

- Appointment and selection of coordinator/agency to manage REMPATI
- Preparation of curriculum and training material
- Recruitment of experts/trainers

Year 2

- Training course (coursework - 3 months; internship - 2 months)
- Three courses per year
- 10 participants per course

Year 3

- Repeat of year 2 activities
- Evaluation

Year 4

- Inter-regional training program for the benefit of MPAs outside the region

Part III. Discussion Papers

Overview of Training Needs, Strategies and Approaches for Marine Park Personnel

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This paper provides an overview of the training needed for managers of marine protected areas (MPAs). Effective training provides managers with the knowledge and skills to undertake the principal objectives of management. Many of the subjects and skills identified are also necessary for other groups involved in the establishment and management of MPAs, such as community leaders, teachers and private sector decisionmakers. The paper is not intended to be prescriptive but rather to discuss the principal factors which need to be considered in the design of MPA training.

Introduction

Management means the full range of activities to produce an MPA and a functioning management system. This includes the analysis of resources, uses and impacts, the preparation of different types of plans, public participation, community mapping and consultation activities, information gathering, storage and presentation, the development and interpretation of legislation, establishment of enforcement and prosecution systems, preparation of education and communication programs and environmental impact assessment, monitoring and review. Management often involves complex tasks but may also relate to relatively simple actions and processes to implement plans such as site maintenance, local area patrolling, limited scientific monitoring and community education. Training for management will depend on the

objectives of management and the activities required to implement the objectives.

Many people may be involved in management of MPAs. These range from senior decisionmakers to field staff and volunteers. Usually these are government employees but may also include consultants, NGOs and community representatives who are directly involved in management.

Goal, Objectives, Outcomes and Outputs

The scope of training for the establishment and management of MPAs is wide, embracing a wide variety of scientific knowledge and techniques, skills for the management of programs, projects, people and funds; skills for reporting and preparation of submissions, skills for field management such as navigation, equipment maintenance, feral animal and weed control and specialized management tools such as spatial analysis, application of economic analysis and the monitoring of social and natural systems. The resources available for training will invariably be scarce. In order to maximize the benefits for the money invested, it is important to clearly define the goal, objectives and desired outcomes of training.

Clearly it is not possible or even desirable for everyone to be trained in all aspects of management, at all levels of specialization. However there will be core information, personal skills and management tools which everyone should have at a basic or introductory level. Further training and level of specialization will depend on the nature of individual responsibilities and available training resources.

The goal of a training program might be 'professional and well trained staff for the management of MPAs'. Objectives should be specific, measurable, time-bound and realistic. After a certain period of time it should be possible to judge or measure the success and long-term effectiveness of the training. Some examples of training objectives are:

- (a) to have all field level staff complete a basic level course in management of MPAs within the first year of appointment;
- (b) to train field staff in rapid assessment techniques for evaluation of coral reefs by the end of 1999; and
- (c) to establish a mentoring system (a system of practical and emotional support established between senior and junior staff) for the support of new trainees during and after basic training.

Desired outcomes are usually changes in behavior and understanding arising from the training programs. Note that these outcomes are different from outputs (products) of the course.

Some possible desired outcomes are:

- (a) increased confidence in management capacity;
- (b) better understanding of the complexity, limits and possibilities for MPA management;
- (c) improved communication between protected area managers and local communities; and
- (d) established network of managers and scientists.

Outputs are the physical products of training. They need to be incorporated in the design of the training programs because they will affect the structure and processes of the programs. Some possible outputs are:

- (a) training materials and reference papers;
- (b) WWW pages;
- (c) certificates of accreditation; and
- (d) personal goals and programs for implementation.

In designing the goals and objectives for training, an important step is to set the management context for the trainee. Trainees should understand that they are not operating in a closed system; they should learn and understand the connections and influences which impact on decisionmaking from outside the MPA. The training could therefore include lectures and information which explain:

- (a) the global, regional and local context for the MPA, e.g., historical and current global and regional initiatives, importance of MPAs for biodiversity conservation and sustainable fisheries, etc.;

- (b) the political, social, economic and cultural systems in which the MPA is to operate—the constraints, threats and support systems for management; and
- (c) the physical and ecological systems and processes relevant to management.

Another important aspect is to provide the trainees with an understanding of the important international concepts and terminologies which are used to establish and structure MPAs. There are many concepts and terms to be learned. In some cases these are ideas or simple terms but they may be open to a variety of cultural and linguistic interpretations. They may not even have been fully tested in field management. When explaining these to MPA managers, it is important to ask questions like "What will this concept look like in practice? and How will we know whether we have achieved or not achieved it?"

These concepts and terms include:

- integrated planning and management;
- ecologically sustainable development;
- biodiversity conservation;
- precautionary principle;
- community-based management;
- capacity building;
- conservation;
- empowerment; and
- environment protection or conservation.

MPA management is principally about the management of people's use or/and impact on the area, rather than the management of the natural resources *per se*. There are very few parallels between marine environment management and the terrestrial management system which might require intervention in natural processes such as weed and feral animal control, fire management, and the breeding of endangered animals and plants.

Training in Establishment and Management of MPAs

Scope

The extent of the training required for effective management depends on a number of factors. Firstly,

there is the management structure for the MPA, particularly the nature of management and administrative responsibility. Are the MPA managers responsible for all aspects or do they share the responsibility with others, e.g., police, fisheries, tourism? Secondly, training will depend on the complexity of the management plan and the regulations. A large multi-use MPA such as the Great Barrier Reef Marine Park requires a detailed zoning scheme to provide for reasonable multiple use and conservation. This requires a relatively sophisticated and technologically complex management regime. A single island and surrounding reef, with perhaps a simple zoning scheme, may require a much simpler management regime. Different cultural contexts may also change the complexity of management. Thirdly, training will be directly related to the responsibilities and activities which have been assigned to staff.

People Who Require Training

The range of people who require training depends on the nature of the management arrangements and the complexity of the MPA. As a general principle, all people involved in the management, whether they are senior decisionmakers, mid-level managers, field level managers, administrative staff or support staff should receive some level of practical training. In addition, consideration should be given to training those who have the capacity to influence or affect the management. These can include community leaders and interest groups, people such as fishers and tour operators who regularly use the area, staff of industries which may affect the area, politicians, teachers and commercial operators. The training of the staff of a tour operator in the ecologically sustainable use of an MPA may save management resources in policing compliance with the regulations. Similarly if the local community has a role in management then training of selected people may provide substantial management support.

Principles in the Design and Delivery of Training

It is suggested that the design and delivery of training courses should follow a number of guiding principles, such as:

- Training should reflect the natural and social systems,

i.e., be integrated, multidisciplinary and interdisciplinary;

- Training should combine theory and practice with a strong emphasis on "learning by doing";
- Training should be culture and gender-sensitive;
- Where possible, relevant traditional knowledge should be integrated into training courses;
- Training should have a strong focus on local problems, utilizing lessons learned from elsewhere but adapting them if appropriate to the local situation;
- Follow up reinforcement is critical to the success of training (the use of mentors should be considered); and
- Training courses should encourage the development of peer networks to provide mutual support after training is completed.

Knowledge, Skills and Tools

There is a wide range of knowledge that managers will need for effective management, including:

- Knowledge about the nature of marine environments (physical and ecological); the nature of the social, economic and political environment; MPAs as a strategy for achieving conservation of biodiversity, sustainable fisheries and ecologically sustainable development; the nature of tropical marine pollution; global and regional context; institutional arrangements and laws; environmental economics; and environmental law.

Managers of MPAs have a range of tools that can be applied either separately or in combination, including:

- Tools such as planning (strategic, zoning, management, site, species, industry, operational) and policy development; community education and extension; community participation in decision-making; environmental impact assessment and review; risk assessment; permits and licenses; user pays; rapid appraisal; legislation; enforcement; surveillance and monitoring. More specialized tools such as spatial analysis/GIS; information management; remote sensing; policy analysis and development; economic instruments and measures; impact mitigation and management; habitat restoration; water quality management; and state of

environment reporting may also be important for some managers.

In order that the knowledge and tools be applied effectively, managers will also need a range of well-developed personal skills, including:

- Skills in problem solving, negotiating, crisis management, communication, leadership, team building and team working, financial and human resource management, project and program management and training of others.

Some staff will need to learn specialized practical skills to assist in the implementation of management in the field such as navigation, database management, boat handling, equipment maintenance, computing skills, search and rescue, and crisis management.

Strategies and Approaches to Maximize the Effectiveness of Training

A range of teaching tools needs to be considered in training. It can extend from formal classroom lectures and problem solving exercises, field exercises, short and long courses and on-the-job training to in-service training, study tours, use of role play/case studies/problem solving approaches, in-country or overseas training, formal mentoring and informal networking.

The ideal outcome from training is that all trainees are able to fully apply the learning as soon as they have completed the course. The reality is that not all trainees have the ability and motivation to change and apply the learning. A lot of training is wasted through lack of adequate followup to reinforce the learning, lack of support on return to the work environment and lack of resources. Strategies and approaches for maximizing the effectiveness of training are therefore important in designing training programs. Some suggested strategies are as follows:

- Target key people who are central to the effective implementation of management, e.g., program managers, decisionmakers, supervisors of other staff;
- Train key people not only in knowledge tools and skills but also in training techniques so that they can spread the knowledge and skills to others;

- Follow up the training with support and mentoring to encourage changes and reduce the loss of motivation;
- Provide access to further information and support after conclusion of training;
- Use mentoring approach, e.g., arranging for the supervisor of the trainee to take responsibility for the application and reinforcement of the learning;
- Use networks of mutual support to discuss problems and offer peer group encouragement;
- Use regional workshops to train selected people who then become the vanguard for training others in-country;
- Use NGOs to develop community training programs;
- Provide in-service training for teachers; and
- Use distance education techniques, e.g., learning by correspondence and radio networks.

Summary

The management of MPAs is potentially complex. Training needs will depend on the management arrangements established for an MPA, the complexity of planning and the responsibilities and duties assigned to the managers. Training should be based on objective analysis of needs, delivered by a combination of methods and supported by mentoring and peer group networks.

Further Reading

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Training Needs and Existing Capacities in Marine and Coastal Protected Area Management: Synthesis of Questionnaires¹

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Background

Marine and coastal protected areas (MPAs) are recognized as a practical way of conserving marine biodiversity, maintaining productivity of marine ecosystems and contributing to the economic and social welfare of human communities, the three critical requirements for sustainable development of coastal and marine areas. MPAs therefore, play a key role in the implementation of several international conventions. In the Jakarta Mandate (1995), the program of action for marine and coastal biodiversity under The Convention on Biological Diversity (CBD), MPAs are one of the five selected themes for the implementation of the CBD. At the first meeting of experts on Marine and Coastal Biodiversity (1997), regional and national training courses for capacity building in Marine and Coastal Protected Area Management were identified as a high priority in the proposed three-year work program. In addition, Integrated Marine and Coastal Area Management was recommended as the umbrella for the implementation of the initiatives with respect to Marine and Coastal Biodiversity. Other relevant international conventions on MPAs include Ramsar, which aim to stem the progressive encroachment on and loss of wetlands and Chapter 17 of Agenda 21, for which the Action Plan specifically requires that states should identify marine ecosystems exhibiting high levels of biodiversity and productivity and other critical habitat areas and provide necessary limitations on use and properly manage these areas through *inter alia* designation of protected areas. The International Coral Reef Initiative Framework for Action has similar provisions for the protection of coral reefs and related ecosystems.

The availability of skilled personnel is fundamental for success in establishing and managing marine protected areas. Increase in funding for MPAs and other actions will be ineffective unless the available pool of personnel for MPA management expands rapidly. Training and development of national capacities for management of MPAs within the framework of ICZM are a fundamental imperative and countries and regions need to become self-reliant in developing capacity to meet their own training needs. International support aimed at developing capacity for MPA management should focus on the development of training capacity within the countries and within regions.

This paper summarizes the results of the questionnaire sent to invited participants to the Workshop on Framework for Future Training in Marine and Coastal Protected Area Management. Respondents include country representatives from Indonesia, Malaysia, Philippines, Thailand, Kenya, Seychelles, Caribbean and South Pacific countries. Representatives from national, regional and international organizations such as the Asian Institute of Technology (AIT), the Caribbean Natural Resources Institute (CANARI), the Coastal Resources Center - University of Rhode Islands (CRC-URI), the Coastal Resources Institute (CORIN), the Consortium of Caribbean Universities for Natural Resources Management (CCUNRM), the South Pacific Regional Environment Program (SPREP), UNESCO, and the World Wildlife Fund (WWF) Philippines. This summary was used as a guide in the working group discussions during the workshop.

Training

Types

To date, training in establishment of MPAs has consisted of site-specific efforts conducted within the scope of specific MPAs. Training activities varied in terms of context, purpose and types of participants. Training courses covered concepts, methodologies and tools as well as management and planning. In 1994, the 1st International Workshop on Marine and Coastal Protected Areas was organized by the Man and the Biosphere Programme of UNESCO together with the Australian Nature Conservation Agency. There have

¹ Some portions of this paper appear in the Workshop Overview, this volume.

been limited regional training opportunities and there has been no substantial effort to define training needs or strategies. Therefore, it is considered an immediate priority to provide further guidance on how to optimize future international training initiatives. Such an approach would require identifying existing training capacities and future training needs, and existing training tools and techniques and further curriculum development needs. Specific attention will be given to the possibility of regional arrangements for training. Management of MPAs requires collaboration between countries to address common problems, e.g., pollution and specific regional priorities and problems can be better addressed within a regional context. Regional programs or conventions such as the Regional Seas Programme provide a framework for developing regional management strategies. The integration of ecological objectives and an ecosystem approach into a management regime and a further operationalization of the concepts of biodiversity will receive major attention in the devel-

opment of such a strategy. A list of training which has been conducted on MPAs and related topics are given in Box 1.

Needs

Training needs range from scientific and technical aspects such as assessment and monitoring of both biological and social science, research on recruitment and larval flow, techniques for planning and zoning of marine protected areas, etc. Other areas that need to be considered are management skill, mobilizing community participation and support as well as income generation. Some important training needs for MPA personnel are listed in Box 2.

Other areas that need to be established/strengthened that would facilitate better communication and success in management of MPAs include: (1) establishment of networks for MPA personnel (Indonesia, Malaysia, Thailand); (2) financing (financial capability/revenue generation) (East Africa, Caribbean, Indonesia, Malaysia); (3) information dissemination (East

Box 1. Types of MPA training conducted in the last five years.

- assessment of biodiversity (Dominican Republic)
- basic skill for nature interpretation (regular course in Thailand)
- biodiversity conservation training (Philippines)
- ecotourism (South Pacific)
- coral reef monitoring/assessment (Caribbean, Indonesia)
- computer skills (regular course in Thailand)
- community participation and collaborative management (Caribbean)
- fish warden deputation training (Philippines)
- forest patroller on law enforcement (regular course in Thailand)
- forest laws (regular course in Thailand)
- forest dendrology (regular course in Thailand)
- internship/attachments (Caribbean)
- integrated coastal management (including MPA) (Indonesia, Philippines)
- law enforcement (Caribbean)
- marine ecology (basic course in East Africa)
- marine nature resource (Indonesia)
- marine conservation strategy (Indonesia)
- MPA design and identification of potential areas (Indonesia)
- MPA management (Thailand, Philippines)
- monitoring and evaluation (East Africa, South Pacific, Malaysia)
- mooring installation (Caribbean)
- planning and management (strengthening capacity) (Caribbean, Malaysia)
- project management (South Pacific)
- reforestation (regular course in Thailand)
- resource assessment (Philippines)
- revenue generation (Caribbean)
- scuba diving (East Africa, Indonesia, Malaysia, Philippines, Thailand)

Africa); (4) internships, exchange programs (cross visits) (Philippines); (5) scholarships for coastal management courses (Philippines); and (6) strengthening institutions (Caribbean, Indonesia, Malaysia, Thailand).

Capacities

Previous MPA training ranged from design and delivery of training programs, curriculum development, preparation of training manuals and training of trainers. Examples of past experiences of various international and regional organizations are given in Box 3. Box 4 gives training capabilities, expertise and facilities available on the national and regional levels.

The types of assistance required for MPA training include the following: (1) curriculum development (Caribbean, Indonesia, Philippines, Thailand); (2) financial support, e.g., purchase of equipment, improvement of facilities (East Africa, Philippines); (3) internship/hands-on training (East Africa, Caribbean, Thailand); (4) training manual preparation (Caribbean, Indonesia, Philippines); and (5) training centers (Philippines).

Future involvement in MPA training by various national and regional institutions include: (1) academic programs; (2) curriculum/training material development; (3) design and delivery of training programs; (4) development of training tools; (5) development of case studies; (6) internships; (7) facilitator of workshops, training programs, seminars; and (8) training of trainers (see Box 5).

Box 2. Important training needs for MPA personnel.

- assessment/monitoring programs (on resources and habitats)
- biosphere reserve concept
- communication skills
- conflict management
- ecological and biological research
- management skills
- marine national park planning and zoning
- mangrove resources (introductory course)
- mangrove resources (sustainable use of)
- mapping (coastal and marine resources)
- mobilizing and promoting the community and public support
- monitoring and evaluation (impact evaluation, tourism activities)
- mooring installation (technical aspects)
- MPA design and planning
- negotiating skills
- nature interpretation skills
- participatory planning and community mobilization
- rapid assessment
- research on recruitment and larval flow
- revenue (income) generation
- resource valuation
- social sciences (anthropology)
- tourism (ecotourism) management
- use of fishing gear for sustainable fishing production

Box 3. Past experiences in MPA training.

- collaboration in reviewing directory of protected areas in South Pacific (SPREP)
- conduct of regional course in participatory and collaborative management (CANARI)
- coastal zone management training (AIT, CRC/URI, ICLARM)
- design and implementation of curricula, instructional modules (CCUNRM)
- marine wildlife conservation (WWF-Philippines)
- MPA case studies development (CANARI, CCUNRM)
- MPA communication strategy (CANARI)
- organize capacity building workshops (ICZM, Biodiversity, Conflict Resolution Monitoring) (UNESCO)
- support for consultants (SPREP)
- technical assistance on MPA management plan development (CRC/URI)
- training manuals on coral reefs and assessment (SPREP, CANARI, ICLARM)
- training on installation and maintenance of mooring buoys (CRC/URI)
- training for park managers and rangers (CRC/URI)

Box 4. Existing MPA training capacities and facilities.

- case studies (development) (CANARI, CORIN)
- communication strategies (CANARI)
- community participation (CANARI, CRC/URI)
- conflict management (CANARI)
- coral reef monitoring program (CCUNRM)
- environmental education strategies (CCUNRM)
- facilities/infrastructure (East Africa, Malaysia, Thailand)
- facilitate and organize training activities (UNESCO, CORIN, ICLARM)
- integrated coastal management planning (CRC/URI, CCUNRM)
- installation and maintenance of mooring buoys (CRC/URI)
- marine resource monitoring (CANARI)
- methodologies, tools, softwares (ICLARM)
- MPA planning (CANARI)
- public education (CRC/URI)
- remote sensing/GIS (AIT, CORIN)
- revenue generation (CANARI)
- stakeholder analysis (CANARI)
- training center on biodiversity conservation and GIS laboratory (WWF-Philippines)
- trainers: marine park (Thailand, Philippines); fisheries officers (Thailand)

Box 5. Types of future involvement in MPA training.

- academic programs (AIT)
- curriculum/training material development (AIT, CANARI, CORIN, CCUNRM, ICLARM, Indonesia, Philippines, WWF-Philippines)
- design and delivery of training programs (CANARI, CORIN, CRC/URI, ICLARM, Caribbean, Indonesia, WWF-Philippines)
- development of case studies (CANARI, CORIN)
- internship (East Africa)
- facilitator (UNESCO, SPREP, ICLARM)
- training of trainers (AIT, CORIN, CRC/URI, East Africa, Caribbean, Indonesia, Philippines)

Recommendations for Curricula, Training Materials and Tools

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Introduction

This paper compares material from the South Asia Co-operative Environment Programme (SACEP) Workshop on Regional Training for the Management of Protected Areas and Coral Island Ecosystems (Sri Lanka, July 1997) which was financed by the Norwegian Agency for Development Co-operation (NORAD) and from a UNEP/COBSEA publication on staff training for the management of marine protected areas (MPAs) published in 1993.

When planning curricula and training materials for marine park management, two basic questions need to be addressed:

1. How to cluster identified training needs into training modules and relate the contents of these modules to the level of managers for whom the modules are developed (e.g., park managers and rangers); and
2. What kind of training materials (manuals, audio visuals, etc.) and tools (software, hardware) exist that can be used in support of the training modules as well as in the general capacity development for MPA management.

Marine Protected Areas Concepts

The Commission on National Parks and Protected Areas (CNPPA) of the IUCN has subdivided the world into 18 marine regions, largely on the basis of biogeographic criteria, but also considering political and administrative boundaries. In a joint project of the Great Barrier Reef Marine Park Authority (GBRMPA) and the World Bank, information about protected areas and habitats was collected and organized into a computerized database which has been used to generate maps showing locations and classifications. Following this work, criteria for selection of priority areas have been developed and a number of MPAs have been identified for each region. Table 1 provides an overview.

Table 1. Distribution and number of MPAs by major marine regions.

Marine region	MPAs	Biogeographic zones with at least one MPA	Biogeographic zones without MPAs
1. Antarctic	17	4	1
2. Arctic	16	8	2
3. Mediterranean	53	10	0
4. Northwest Atlantic	89	5	1
5. Northeast Atlantic	41	8	1
6. Baltic	43	5	1
7. Wider Caribbean	104	4	1
8. West Africa	42	4	1
9. South Atlantic	19	4	2
10. Central Indian Ocean	15	8	5
11. Arabian Seas	19	3	2
12. East Africa	54	8	0
13. East Asian Seas	92	12	8
14. South Pacific	66	8	1
15. Northeast Pacific	168	7	1
16. Northwest Pacific	190	3	3
17. Southeast Pacific	18	17	2
18. Australia/New Zealand	260		
Total	1 306	118	32

Source: Global representative system of marine protected areas. Vol. II, GBRMPA, World Bank and IUCN (1995).

Depending on the objectives and criteria for protection and exploitation, IUCN proposes six categories of MPAs:

- I a Strict Nature Reserve;
- I b Wilderness Area;
- II National Park (protection and recreation);
- III Natural Monument (conservation);
- IV Habitat and Species Management Area (protection);
- V Protected Land and Sea Scapes (combined conservation and recreation); and
- VI Managed Resource Protected Area (sustainable use of ecosystems).

Each of these categories will have a legal structure under national and international laws and will have its own management requirements and objectives. In some countries, a marine park is a strictly protected

area and no resource use is allowed at all. Sometimes a combination of protection and use is allowed. An important requirement for all management plans is the zoning of marine parks into different categories, e.g., general use zones; habitat protection zones; buffer zones; national park zones; and no structure zones which relate to different levels of protection and allowable use of resources.

Training and Planning/Comparison of Existing Training Modules

The two courses mentioned in the introduction to this paper are compared on a number of aspects, such as organizing (responsible) parties, target groups, objectives and additional requirements (Table 2). The courses are very different in content, but similar in target group and objectives. Both courses require substantial basic knowledge of marine ecology at the start. The training staff is expected to develop most of the actual training material themselves (not much standard material is used). For the UNEP/COBSEA course, there is a very comprehensive training manual available. The SACEP/NORAD course, which is only at the proposal stage, is a short-term training intended to last only two weeks. The UNEP course is expected to last approximately two weeks per module. The full training could take more than one year.

The courses seem to have a rather low emphasis on cross boundary (area/regional) issues and related risk management (e.g., importance of nearby shipping lanes, pollution and erosion) issues. The material is mainly focused on nature protection and marine biology and less on integrated planning. In the SACEP/NORAD short course, there is no specific module on legislation, enforcement, surveillance and management. The modules in both the courses are very well structured (e.g., the UNEP workshop example uses an 'introduction/body/conclusion' structure and repeats this a few times).

In addition to the material presented, it is noted that attention should be given to the selection of literature (and/or audio-visual materials) to be read/consulted before and during the course. It is also important that people exchange ideas by presenting information about their own MPA and its national and re-

gional setting to others. It is also suggested that the training should include information on the use of concepts and tools and utilization of common definitions for planning and management of MPAs.

The courses are very concise, including the sections dealing with knowledge of basic issues such as ecology and water (environmental) quality. With regard to this, it is important to have a discussion on key issues for the development of a short course in MPA management and to relate this to its objectives. The question is to provide 'value for money' as many people agree that a lot of money is wasted on training that is not suitable for the people and in the environment for which it is organized.

The MPA management training courses described here are conventional and do not make use of many advanced options for planning and monitoring, either administratively or in the field. For both analysis (multicriteria analysis techniques, planning models, GIS and remote-sensing software and hardware) as well as planning and outreach a lot of material (internet applications, role plays, integrated planning models) is available which could directly improve the quality of work and should be used.

Proposed Structure

It is important that a common structure and concepts language is developed for MPA management training and it is suggested to develop a module specifically for this purpose. The other modules proposed here are a combination of the modules used in the SACEP and UNEP training. The idea is that the structure of the training is simple and allows for clustering of subjects related to clearly identifiable needs. It is suggested that this workshop develop a modular structure under the following headings:

1. Introduction about selection criteria (e.g., international guidelines, cross boundary issues, etc.) for MPAs in the international context, followed by identification of basic criteria for MPA planning and problem analysis (e.g., identification of different stakeholders and conflicts of interest) and methodologies and tools to deal with integrated planning issues.

2. Introduction to sociopolitical issues and legislation (national/international) including organization of local communities and community-based management approaches and concepts.
3. General knowledge on marine ecosystems dealing with environment, biology, ecology and systems parameters (currents and tides, wave patterns, climate, etc.).
4. MPA management and planning (including cost effectiveness, cost benefit analysis and cost recovery) introducing project management, management information systems, planning and zoning, enforcement, etc.
5. Implementation and monitoring dealing with materials and tools for MPA management such as training in GIS and remote sensing, database management, field surveys (ecological and socioeconomic), role plays, decision support systems and models, multicriteria analysis, information communication and outreach techniques, maintenance of park and equipment, etc.

Proposed Training Facilities

Integrated planning tools and role plays

This relates to information and mobilization of stakeholders at an early stage of planning. A first step in the process is to make an analysis and evaluation of strategies that may be followed for planning of the MPA under different scenarios². The methodology follows a so-called 'Framework for Analysis' consisting of six consecutive steps in the formulation, analysis and evaluation of coastal zone management plans. The sequence is demonstrated in COSMO, a coastal zone management demonstration project, dealing with the problems of 'Catopia Bay' shown in the annex. Following the sequence of analysis the program allows for a number of alternative development options in terms of indicators such as the income situation, employment levels and environmental quality standards. Using multicriteria techniques different alter-

natives can be weighed against each other leading to preferred options. These techniques, which can also be used in an interactive way in role playing, allow for a very clear interaction with stakeholders in the early stages of the planning process, which is important for involvement and support by stakeholders at a later stage.

Examples of monitoring tools

Many different techniques are available for planning and monitoring of MPAs of which GIS and remote sensing in combination with database management and field surveys (ecological and socioeconomic) are probably the most important. It is important that standardized methods for use of indicators and survey methods are developed and used, such as in the ASEAN/AIMS/UNEP standard reference methods for marine pollution studies (1993) which describes ecological indicators for coral reefs and mangrove areas. Use of databases in combination with a well-developed interface makes data easily accessible for information and management purposes. An example is the database and monitoring tool that is presently being developed for the coral reef rehabilitation and management project (COREMAP) in Indonesia.

Modern information technology has a role to play in MPA planning and management on all levels. Multicriteria analysis can be an important communication tool in participatory planning and early communication about alternative planning options with local communities. Audiovisual aids can play a role in outreach and help to convey a message to the general public and to specific target groups. Use of computers and the internet makes the data available to local park managers wherever they are and could allow for very cheap communication with colleagues around the world. It can also play a role in exchange of information and specific data on a regional and/or national level. It is recommended that this workshop start an inventory on the options to be included in future training and support for MPA managers and staff.

² The methodology relates to coastal zone management software that was developed by the Resource Analysis and the Coastal Zone Management Centre for the World Coast Conference.

Table 2. Comparison of SACEP-NORAD and UNEP/COBSEA training course/modules.

SACEP-NORAD (1997)	UNEP/COBSEA ¹ (1993)
Participants <ul style="list-style-type: none"> ▪ SACEP ▪ ICRI (GCRMN) ▪ IOI (Central Office and India) ▪ MPA Seychelles <p>Countries involved: Pakistan, India, Bangladesh, Sri Lanka, Maldives</p>	Participants <ul style="list-style-type: none"> ▪ UNEP (RCU/EAS) ▪ James Cook University ▪ Great Barrier Reef Marine Park Authority (GBRMPA) ▪ INTROMARC ▪ AIDAB / AUSAID ▪ University of Queensland (Gatton College) ▪ MOSTE (Malaysia) <p>Countries involved: Malaysia, Philippines, Thailand</p>
Title Training Course in Integrated Management of Coastal and Marine Protected Areas	Title Staff Training Material for the Management of Marine Protected Areas
Target groups <ul style="list-style-type: none"> ▪ potential and actual middle-level coastal and marine protected areas administrators/managers and practitioners 	Target groups <ul style="list-style-type: none"> ▪ MPA personnel, ranging from field staff working in local offices to managers and directors responsible for long-term planning
Objectives ⇒General <ul style="list-style-type: none"> ▪ improve knowledge and skills of participants in Coastal and MPA management ▪ increase capacity of participants to plan and manage MPAs ▪ provide reference material and contacts for future use ⇒per module <ul style="list-style-type: none"> ▪ Module 1 - understand the types of coastal and marine ecosystems and the nature of impacts that affect them ▪ Module 2 - participant able to recall key indicators for the state of the environment reporting and appreciate role of monitoring in management and decisionmaking ▪ Module 3 - participant able to recognize the need for and mechanisms of involvement of stakeholders ▪ Module 4 - participant aware of the different approaches to coastal and MPAs and able to recognize steps for identification and declaration of MPAs ▪ Module 5 - participant able to relate the principle components of environmental impact assessment (EIA) and able to identify whether a proposal requires a formal EIA approach 	Objectives ⇒Modules 1-5 <ul style="list-style-type: none"> ▪ understand the nature of the marine environment ▪ appreciate the complexity of ecological issues ⇒Modules 5-12 <ul style="list-style-type: none"> ▪ appreciate national and international contexts ▪ understand legal mandate ▪ understand role and responsibilities of managers ▪ ability to carry out resource, site and user monitoring programs in conjunction with professional staff ▪ understand the role of public involvement and public contact programs in short and long term management ▪ ability to develop a MPA surveillance program adjusted to local situation ▪ have knowledge of enforcement principles and able to apply in a field situation ▪ ability to establish and manage a maintenance program in a MPA <p>Note: All modules may be taught individually (stand alone) and/or adjusted to training needs. Modules 1-3 should be done first.</p>

¹ The Co-ordinating Body of the Seas of East Asia is the intergovernmental decisionmaking body of the East Asian Seas Action Plan.

Table 2 continued

SACEP-NORAD (1997)	UNEP/COBSEA ¹ (1993)
Duration	Duration
Two weeks	Two weeks per module; the whole course may take more than one year depending on number of modules taken
Module setup	Module setup
<ul style="list-style-type: none"> ▪ objective ▪ contents ⇒based on topics supplied by SACEP ▪ duration ▪ extra reading ⇒to be determined by developer of module ▪ evaluation 	<ul style="list-style-type: none"> ▪ objective ▪ module training sessions summary ▪ background and sequence of module ▪ training sessions per module separate subject ⇒sequence ⇒introduction ⇒body ⇒conclusion ⇒task sheets ▪ summary
Modules compared	Modules compared
<p>Module 1: Coastal and marine ecosystems and processes</p> <p><i>Objective:</i> Understand the types of coastal and marine ecosystems and the nature of impacts that could affect them</p> <ul style="list-style-type: none"> ▪ ecosystem types and interrelationships ▪ natural variability ▪ anthropogenic influences 	<p>Module 1: Nature of the marine environment</p> <p><i>Objective:</i> Describe the stronger and more extensive linkages between near and distant marine ecosystems as compared with those of terrestrial ecosystems</p> <ul style="list-style-type: none"> ▪ open sea principle ▪ reproductive strategies of species ▪ sea as medium for food transportation and distribution ▪ hazards/pollution ▪ special places and organisms
<p>Module 1. Coastal and marine ecosystems and process</p>	<p>Module 2: Sea as a place to live</p> <p><i>Objective:</i> Review the physical, chemical and biological characteristics of the marine environment and compare these to terrestrial ecosystems</p> <ul style="list-style-type: none"> ▪ the water environment ▪ nutrients and pollution ▪ maintaining the system <p>Module 3: The sea as a large dynamic system</p> <p><i>Objective:</i> Review the causes of tides and currents and the effects of the large scale process on physical, chemical and biological conditions of the sea</p> <ul style="list-style-type: none"> ▪ tides and currents ▪ upwelling and exchange currents

continued

Table 2 continued

SACEP-NORAD (1997)	UNEP/COBSEA' (1993)
Participants	Participants
<p>Module 1 and Module 5: Environmental impact assessment (EIA) in coastal and marine protected areas</p> <p><i>Objective:</i> Able to relate the principal components of EIA and able to identify whether a project proposal requires a formal EIA approach</p> <ul style="list-style-type: none"> ▪ justification for EIA (biodiversity convention) ▪ the need and components for EIA ▪ project screening 	<p>Module 4: Use of and threats to the marine environment and its resources</p> <p><i>Objective:</i> Review the variety of uses of the marine environment and its resources and threats to sustainable use in the absence of regulation</p> <ul style="list-style-type: none"> ▪ use of the marine environment ▪ threats to the marine environment
<p>Module 2: State of the environment - key indicator for management and</p> <p>Module 4: Planning for coastal and marine protected areas</p>	<p>Module 5: Marine protected areas of the world</p> <p><i>Objective:</i> Introduce concepts of MPAs and the five IUCN criteria for identifying and selecting MPAs and to relate these to local circumstances</p> <ul style="list-style-type: none"> ▪ roles and objectives of MPAs ▪ international categories ▪ selection criteria ▪ jurisdictional issues ▪ locally relevant selection criteria
<p>Module 3: Stakeholder involvement in management of coastal and MPAs and</p> <p>Module 4: Planning for coastal and marine protected areas</p>	<p>Module 6: Overview of MPA management</p> <p><i>Objective:</i> Understand and apply the principles of the organizational structures of MPA management and the role of management in relation to natural resources and users</p> <ul style="list-style-type: none"> ▪ organizational structure ▪ relationship between resources, users, managers and operations ▪ budget ▪ human resources ▪ management tasks
<p>Module 4: Planning for coastal and marine protected areas</p> <p><i>Objective:</i> Be aware of the different approaches to management of coastal and marine protected areas and able to recognize the steps for identification and declaration of MPAs</p> <ul style="list-style-type: none"> ▪ range of options (prescriptive or community based) ▪ conventional criteria for site identification and nomenclature ▪ concepts, types and selection of MPAs ▪ planning techniques 	<p>Module 7: Planning for MPAs</p> <p><i>Objective:</i> Understand the concept of multiple use, day-to-day management and the planning process</p> <ul style="list-style-type: none"> ▪ principles, approaches and guidelines ▪ zoning for management purposes ▪ public participation in planning

continued

Table 2 continued

SACEP-NORAD (1997)	UNEP/COBSEA' (1993)
Participants	Participants
<p>Module 2: State of the environment reporting - key indicators for management</p> <p><i>Objective:</i> Able to recall the key indicators for "state of the environment (SOE)" reporting and appreciate the role of monitoring in management decisionmaking and review</p> <ul style="list-style-type: none"> ▪ purpose of SOE reporting ▪ biodiversity convention reporting needs ▪ global and regional reporting mechanisms ▪ monitoring techniques 	<p>Module 8: Research and monitoring for MPAs</p> <p><i>Objective:</i> Examine the role of research and monitoring in the management of MPAs and how to incorporate these activities into an MPA management plan</p> <ul style="list-style-type: none"> ▪ resource assessment, monitoring and management ▪ field-based assessment and monitoring
<p>Module 3: Stakeholder involvement in management of coastal and marine protected areas - what, why, when, how</p> <p><i>Objective:</i> Able to recognize the need for and mechanisms of involvement of stakeholders in coastal and marine protected areas management</p> <ul style="list-style-type: none"> ▪ importance of stakeholder involvement ▪ techniques for stakeholder identification and involvement 	<p>Module 9: Public contact programs for MPAs</p> <p><i>Objective:</i> Understand the principles and processes of targeting an audience, identify your message and effectively direct your message to the audience</p> <ul style="list-style-type: none"> ▪ role of public contacts, methods, options, learning principles ▪ planning and development of a public contact program
<p>Module 2: State of the environment reporting - key indicators for management</p>	<p>Module 10: Surveillance for MPAs</p> <p><i>Objective:</i> To understand the objectives and methods of surveillance and develop skills for surveillance planning</p> <ul style="list-style-type: none"> ▪ overview ▪ objectives and methods ▪ develop a plan for surveillance
not covered	<p>Module 11: Maintenance programs for MPAs</p> <p><i>Objective:</i> Develop understanding of the importance of maintenance in your day-to-day management and how to incorporate this into your own management program</p> <ul style="list-style-type: none"> ▪ make inventories; develop procedures; develop skills and training ▪ prepare maintenance plan
not covered	<p>Module 12: Enforcement</p> <p><i>Objective:</i> Understand legislation and principles of investigation for effective enforcement activities</p> <ul style="list-style-type: none"> ▪ powers of officers/investigation techniques ▪ application of relevant components of the law ▪ elements of charge/sanctions

Marine Reserves and Biodiversity: Toward 20% by 2020

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Introduction

Definitions of what constitutes a marine reserve vary greatly among authors. In this short discussion, a marine reserve will be taken to mean an area of marine water from surface to bottom that is subjected to substantially reduced harvest pressure and other forms of ecological stress (pollution, siltation, dredging, etc.) than other areas in the vicinity because of restrictions on human activities.

Considerable debate has centered on the most efficient design for a marine reserve from an ecological standpoint. Less concern has been directed towards determining the most efficient approach to the implementation of marine reserves from a societal standpoint. Johannes (1997) has called for the implementation of 'dataless' reserves – those based on criteria and investigative skills available to the average municipality in a developing country.

Recent calls for the setting aside of 20% of the world's oceans as marine reserves by the year 2020 (Lubchenko 1997) have helped to emphasize the scale of the problem to be dealt with. The implementation of reserves covering many millions of km² of ocean will require a reconsideration of priorities and criteria for reserve establishment.

Patterns of Marine Biodiversity

Species richness tends to be higher in tropical than temperate seas. Within the tropics, marine diversity is highest in Southeast Asia, diminishing slightly to the west toward East Africa and diminishing rapidly eastward across the Pacific. The Eastern Pacific and Caribbean tend to have one-fourth or less of the species found in Southeast Asian waters. On the other hand, species endemism tends to be low in Southeast Asia and highest in areas of insular isolation such as the Central Pacific (Rosen 1981, 1988; McManus 1985; Veron 1993a, 1993b, 1995). Species

richness tends to be highest in shallow, coastal waters (Marshall 1963), although the species richness of deep-sea basins is believed to be underestimated because of the paucity of data available. There is evidence of high endemism in the basins of peripheral seas (McManus 1985). Among marine ecosystems, coral reefs support the highest known diversity (Birkeland 1997). Global prioritization of protective action must balance species richness against endemism, the latter often being related to the threat of extinction.

Threats to Marine Biodiversity

Just as most of the diversity of the sea is concentrated in shallow coastal waters, so too are most of the threats to marine ecosystems. Land-based pollution and siltation are commonly cited sources of stress to shallow ecosystems. Loss of critical habitats such as mangrove forests, fringing coral communities and estuaries are believed to have widespread consequences for species that may only spend part of their life cycles along the shore, such as many species of marine fish (Pauly 1982). Destructive fishing is another cause for concern, particularly because of the wide range of nontarget species involved and the direct impact on ecosystem resilience brought about when, for example, slow-growing corals are blasted or poisoned with sodium cyanide in the course of fishing (McManus 1996; McManus et al. 1997). A particularly destructive form of fishing that is often overlooked is bottom trawling. This activity is widespread throughout the shelf areas of the world, and includes the systematic reduction of sponge and coral communities that support important target fish species (Sainsbury 1991; McManus 1997; Sainsbury et al. 1997). Overfishing is increasingly identified as a major problem affecting the marine ecosystems of the world (Pauly and Christensen 1995). Approximately 70% of the world's major fisheries are at or beyond optimal fishing levels (FAO 1992; Williams 1996). Overfishing can lead to shifts in marine fish communities from suites of economically valuable species to dominance by species of less value to humans (Pauly 1979; Sainsbury 1991; Sainsbury et al. 1997).

Generally, loss of aquatic habitats and reductions in biomass are believed to lead to local extinction of

species (McManus et al. 1992; Galzin et al. 1994), but not necessarily total extinction. An exception to this has been the case of small islands supporting endemic species of limited range for which further range reductions are believed to dramatically increase the chances of total extinction of the species (Jackson 1995). It has long been thought that the widespread nature of most marine species would indicate a high resistance to total extinction. However, recent work on forest species has suggested that even widespread species can become susceptible to extinction following range fragmentation and population reduction (Tilman et al. 1994). Given that overfishing generally involves reductions in community biomass exceeding 50%, that this reduction often results in local losses of less abundant species and that overfishing and habitat destruction is often spread wider than the species ranges of concern, then there is a possibility of total extinction even among some common species (McManus 1997, in prep.).

Ecological Considerations in Reserve Implementation

A large body of literature is focussed on the design and implementation of marine reserves (e.g., Kenchington and Looi 1994; Gubbay 1995; Kelleher et al. 1995). One issue which is common to protected area design on both land and sea is the question of 'single large or several small (SLOSS)' reserves. Other issues important to marine reserve design are the ratio of edge area to central mass and the deployment of reserves relative to each other and to oceanographic features important in maintaining population recruitment – the counterpart of the 'corridor' problem in land reserves.

Fundamental to the discussions is the realization that the vast majority of benthic marine organisms have pelagic life stages lasting from hours to months. Thorsen (1971) suggested that the average benthic marine invertebrate is pelagic or planktonic for about two weeks before settling. Studies of published data on coral reef fish indicate that roughly half of the species tend to be pelagic for more than three weeks (McManus 1995; McManus and Meñez 1997). During that time period a fish born in the Malaysian Sumatra could theoretically ride seasonal currents and

settle in Vietnam (McManus 1994). Corals generally have much shorter pelagic stages, ranging from a few hours to a few days, with some exceptions (McManus 1995; McManus and Meñez 1997). However, the generally northward nature of currents and loss of coral cover in the Philippines led Veron (1992) to conclude that coral species in Japan may face local extinction because of the degradation of Japanese reefs combined with the depletion of rejuvenating coral recruits moving (presumably) stepwise, generation after generation, to Japan.

A major focus of research on coral reef fish has been the degree to which individual reefs are self-seeding, i.e., generating their own recruits. Some researchers have emphasized the long pelagic stages and inferred that long distance dispersal is important, that a given reef may be dependent on other reefs hundreds of kilometers away for population renewal (e.g., Thresher 1991). Others have found oceanographic features that tend to accumulate pelagic stages and suggested that many species may be adapted to return to the reef of their birth (e.g., Leis 1991). Still others have suggested that large groups of reefs contribute to common pools of pelagic stage organisms, many of which return to the originating reef (e.g., Doherty 1991). However, regardless of the fate of the average organism on a particular reef, it is likely that at least some portion of the pelagic cohort is swept considerable distances among reefs. This assumption is borne out by some studies of the genetics of organisms, such as the coral-eating Crown-of-thorns Starfish (*Acanthaster planci*), which indicate close genetic linkages across vast distances in the Southern and Central Pacific (Benzie 1992). The "spillage" is likely to become increasingly important to the rejuvenation of increasingly heavily harvested and stressed reefs and was the basis for the proposal to set aside the disputed Spratly Islands of the South China Sea as an international marine park (McManus 1994, 1995; McManus and Meñez 1997).

The ecological requirements of marine organisms vary tremendously among species, including the size of habitat required for population support. Many species spend their entire post-pelagic lives firmly attached to the spot to which they are recruited. At the other extreme are highly migratory species such as tuna and swordfish, some of which migrate thousands

of kilometers. Many fish species living on temperate and tropical reefs move widely over a given reef and may cover several reefs in their range, as is common among reef sharks. Others are known to farm small patches of algae on dead coral and to move very little beyond their small home range. In purely ecological terms, the best reserve is that which encompasses the entire Earth. However, complex sets of societal factors prevent this, including the survival of large human populations. Optimization thus implies weighing the benefits of setting aside large areas of ecosystem against the economic, social, cultural and political difficulties of doing so. Given any set of optimization criteria, such as the cost of the reserve versus the enhancement of survivability of each local population of organisms, the consideration of a wide range of species requirements will result in a wide range of optimal reserves. Thus, the answer to the SLOSS and related questions in dealing with a wide variety of species is probably the establishment of reserves in a wide range of sizes and shapes.

Societal Considerations

Anthropocentrically speaking, the basic purpose behind a marine reserve is to maintain representative ecological communities close to the natural state, so that associated natural resources and services will be available to humans across many generations. For example, a portion of coral reef set aside as a reserve may help to ensure that economically valuable fish will be available in adjacent areas as they migrate out of the reserve. Simultaneously, it may support calcareous algae and Foraminifera that provide sand for tourist beaches and its wave-breaking calcareous crest may provide protection from waves for houses along the shore. Alternatively, although the coral community in the reserve may not provide these services directly, the reserve may provide recruits to other reefs that do provide such services. Thus, the benefits of a reserve may be direct, indirect or a combination of the two.

A growing emphasis on village level management, co-management and multi-sector management of the coastal zone has resulted from the realization that effective management of resources requires harmful practices to be not merely illegal but also socially unac-

ceptable (McManus et al. 1988; Pomeroy and Williams 1994; McManus 1995, 1996). Marine reserves imposed on municipalities by provincial or national governments may foster local social acceptability of violating the reserve regulations, and a violator may approach the status of a local "Robin Hood" – battling against 'unjust' outside regulation of resources. Participation in the decision-making process may result in a community sense of 'ownership' of the regulations, thus putting social acceptability and unacceptability to effective use.

There is another practical consideration favoring village-level development of marine reserves. In many developing countries coastlines are simply too long for the few scientists and trained policymakers to be able to effectively analyze and optimally manage. The reserves that must be implemented along crowded coastlines will often be small, lest whole groups of villages be entirely removed from their resource base. Thus, countries such as Kenya, Tanzania, Madagascar, Indonesia, the Philippines, Venezuela, Brazil and others face the task of implementing hundreds or thousands of small reserves in each country. None of them has the personnel resources to assign scientists to more than a few selected areas in a given year. However, it is precisely the concentrated efforts of field scientists which have resulted in the establishment of many of the existing reserves throughout the world.

The solution would be to develop programs to encourage the establishment of reserves at village and municipal levels. This would include providing simple guidelines to the public on general considerations in the development of marine reserves. Some of these guidelines might include, for example:

1. The total area of the reserve(s) should encompass approximately 20% of the waters under local jurisdiction.
2. The boundaries of the reserve(s) must be clearly marked with buoys, posts and landmarks.
3. The reserve(s) should include approximately one-half of the major fishing grounds.
4. Fish migration routes should be protected as completely as possible.
5. For coral reefs, the reserve(s) should include major channels and clusters of minor channels through the reef, which tend to be breeding grounds for fish.

6. The reserve(s) should include representative portions of all available ecosystem types, including mangroves, estuaries, seagrass beds, reefs, etc.
7. The reserve(s) should extend across representative depths from shallow to deep.
8. Where possible, the landward side of the reserve(s) should be protected and maintained in a natural state.
9. Some portion of the reserve(s) may be set aside to generate money from tourism via entry or mooring fees. This portion should be not more than one-half of the reserve, and must be protected from harmful activities such as coral collecting and anchor damage.
10. The reserve(s) must be patrolled by people empowered to make arrests where necessary. For example, these may be local rangers financed by the proceeds from the limited tourism or other income generating activities.

With general guidelines such as this, and some guidance on coastal resource mapping, it should be possible for people to set aside meaningful reserve areas with little or no national or provincial-level expertise. It is recognized that trained experts might be able to design more optimally effective reserves, particularly from the ecological standpoint. However, on a large scale, optimality involves widespread, rapid implementation. Only a system of reserve implementation independent of scientists could approach such scale.

Conclusions and Recommendations

The task of ensuring the sustainable use of marine resources for future generations should involve the implementation of a wide variety of marine reserves in various shapes and sizes, covering approximately 20% of the oceans. Some large reserves being established for specific reasons may appropriately involve scientists and considerations of optimal shape, size and geographic deployment. However, most reserves will necessarily have to be developed in the absence of scientists by local coastal people. This can be best achieved through programs aimed at providing guidelines for the general populace and by encouraging communities to set aside the reserves for the benefit of their progeny.

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Appendices

1. Workshop Program

3-7 November 1997

3 November

A.M.

8:30 Registration

9:00 Welcome address

Dr. Peter R. Gardiner, Deputy Director General (Programs), ICLARM

9:15 Workshop overview

Ms. Carien van Zwol, Coastal Zone Management Centre

9:45 Self introduction by participants

10:15 Coffee break

10:30

Session I

Identification of training needs, assessment of existing capacity, approaches and strategies for optimal use of available resources

Overview of MPA training needs and options, strategies and approaches for the future

Dr. Simon Woodley

11:00 Open forum

12:00 Lunch

P.M.

1:00 Presentation of synthesis of questionnaires (ICLARM)

1:15

Session I.a

Assessment of needs and current capacity

Working group discussions - regional issues

2:45 Coffee break

3:15 Working group discussions (continued)

5:00 End of session

4 November

A.M.

9:00

Session I.b

Training approaches and methods

Working group discussions

10:00 Coffee break

10:30 Working group presentations on Sessions I.a and I.b

12:00 Lunch

P.M.

1:00

Session 2
Recommendations for curricula, training materials and tools

Recommendations for curricula, training materials and tools
Joop de Schutter

1:30

Working group discussions

3:00

Coffee break

3:30

Working group discussions (continued)

5:00

End of session

5 November

A.M.

7:00

Leave for Batangas

10:00

Expected arrival at Batangas

Snorkeling

12:00

Lunch break

P.M.

1:30

Session 3
Role of MPA in biodiversity conservation

2:00

Discussion

3:00

Coffee break

3:30

Leave for Manila

6 November

A.M.

9:00

Session 2: Working group presentations

10:00

Coffee break

10:30

Session 4
Opportunities for cooperation with regional programs for future implementation
of training programs

Brief statements by:

- World Bank
- ADB

Discussion

12:00

Lunch

P.M.

1:15

Session 5

Building training capacities in the regions

Brief presentations by:

- CORIN
- MSI
- CRC
- ICLARM
- AIT
- CANARI
- SPREP
- WWF-KKP
- HARIBON
- *Simon Woodley*

2:30

Coffee break

3:00

Working group discussions

5:00

End of session

7 November*A.M.*

8:30

Working group discussions
Session 5 (continued)

10:00

Coffee break

10:15

Working group presentations

11:15

Workshop wrap-up
Review of outputs
John W. McManus, Ph.D.

11:45

Open forum

12:15

Closing program
Dianeetha Sadacharan

12:30

Lunch break

P.M.

1:30

Leave Holiday Inn (ICLARM visit)

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3. Regional Working Group Outputs

Session 1 - Working group 1: Southeast Asia

Assessment of training needs and current capacity

It was noted that there is a need for the group to come up with a common understanding on who are the people that belong to the different levels of MPA management, prior to the discussion of identifying the training needs of the region.

In the identification of the training needs of both the senior and mid-level management, the group first established an understanding on the actual scenario in the region with regards to MPA management. It was noted that

1. About 95% of protected area management staff has a forestry background, with the exception of Malaysia where MPAs are managed by the Fisheries sector;
2. The region has large bureaucracies;
3. MPA is a relatively new concept;
4. Efficient planning mechanism is lacking; and
5. Capacity and awareness to manage MPAs need strengthening.

Senior Managers. It was agreed that the senior level of MPA management are heads of marine park sections and divisions as well as the decisionmakers—the Director Generals, Department Secretaries, Ministers, Directors or equivalent, steering committees, budget controllers, etc. The training needs for the senior level managers include:

1. Familiarization with the general concepts of MPAs. If the senior managers do not have a background in marine and coastal management and conservation, a program to familiarize with the basic knowledge on MPA should be designed; and
2. Awareness of nature conservation (via an information education campaign). It is important for them to understand what MPAs are and why they should be protected and sustainably developed.

Training approaches for senior managers includes orientation programs incorporating study/educational tours/'Open Day'. This can be done both locally or

internationally. It can be a combination of site visit and on-site lectures that would help them understand how things operate in the field.

Mid-level Park Management. The group defines the mid-level park management personnel as those people who are in-charge of the operational management and those who assist in the technical management planning of an area under protection.

The training needs identified for this level of management are prioritized according to their importance and urgency.

First-priority training needs identified for this level include:

1. Basic environmental knowledge such as oceanography, marine/island ecology, hydrology, geology and natural history. This is important because the existing MPA management staff in the region generally have forestry backgrounds;
2. Good knowledge of local resources, what is there to protect and why, information on the social, economic, cultural and political situation in the area; how resources are being used, pollution and the human impacts in the area; tourism, etc. Techniques and methodologies on how to access/gather such basic information on the area should be provided;
3. Additional knowledge on the concepts of MPA management should be provided to ensure effective and efficient performance in managing MPAs. It is also important that the MPA management should have access to knowledge about updated and existing policies at the global, regional and national levels;
4. How to conduct awareness/environmental education program as well as to produce materials, nature interpretation, etc., to support this activity;
5. Good understanding of the legislative and regulatory framework (law enforcement), include law enforcement mechanisms in MPAs;
6. Appreciation and understanding of multiple and conflicting uses of coastal and marine ecosystems and training on conflict resolution is needed; adopting systems approach management; application of carrying capacity and limit of acceptable change (LAC) concepts;

7. Ability to conduct and develop alternative livelihood programs;
8. Skills in constituency building to obtain public support, encourage the involvement and participation of stakeholders;
9. Skills in establishment of networks within and among agencies, NGOs, and the private sector.
10. Surveillance and monitoring techniques to provide early warning on harmful impacts of human activities;
11. Knowledge on how to maintain park facilities, equipment and infrastructure;
12. Understanding the concept of strategic management planning (e.g., designation and delineation of various zones in MPAs, the project cycle process, etc.); and
13. Finally, general management skills (human resource management and development, administration and finance, leadership, computer skills, etc.).

Second-priority training needs listed by the group include:

1. Hazard and risk management, which encompass safety, first aid and search and rescue programs;
2. Ways and means to generate more income to promote sustainable financing of MPAs;
3. Knowledge on effective rehabilitation of degraded areas in MPAs;
4. Management tools such as GIS, EIA, remote sensing, resource valuation, rapid assessment methodologies and habitat and use mapping;
5. Management of research activities (logistics to support policy recommendations and management planning); and
6. Basic knowledge of waste management.

Those identified as third-priority training needs for the region include the conduct of extensive resource inventories and monitoring, preparation of proposals and review of project proposals by various sectors, including NGOs.

Existing Capacity for Training Managers in the Region. The existing training courses offered in the region, generally conducted by government agencies, academic institutions, NGOs, foreign assisted projects and various international bodies, include specialized

skills on MPA management. They include coral reef assessment, remote sensing, marine wildlife conservation, GIS and, to some extent, community organizing and strategic planning which are available for all management levels. This indicates that among the courses offered in the region, management skills are wanting.

There are also specialized *ad hoc* training courses available in the region. However, most of them are project-related. They are generally donor driven and are carried out by local, regional and foreign trainers.

The group recognizes that there are gaps with respect to the training needs in the region. There is no continuity of these training courses, as they are project-related in nature. Scholarship (both local and foreign) opportunities in the region are irregular. Other gaps identified are the lack of sustainable financing mechanisms, lack of formal and informal MPA training programs presently offered and the need to establish a Regional MPA Training Center with regular coordinators and trainers.

Training approaches and methods

The current methods used for training in the region are *ad hoc*, nonstructural, on the job, senior graduate/postgraduate course (three weeks); Masters degree in conservation or coastal zone management (University of Rhode Island, New Castle University, James Cook University, etc.); and Integrated Coastal Zone Management by the University of Rhode Island where Thailand, Sri Lanka, Indonesia, Philippines and CORIN are represented/invited.

In the assessment of this training, several problems have been identified, such as frequent transfer of staff, lack of continuity, irregularity, donor driven, absence of mechanism on maintaining motivation, lack of training for trainers, lack of adequate facilities, lack of expertise, and absence of library facilities.

Among the programs being initiated and implemented in the region are the Sulu Celebes Sea Integrated Conservation and Development Program proposed for funding by the GEF; the ASEAN Regional Center for Biodiversity Conservation funded by the EU (it is recommended that the training component will focus more on the marine and coastal ecosystems); the Subic Biodiversity Training Center; ICZM-

focused training in the Philippines; TRAIN-SEA-COAST-affiliated institutes (CORIN); Phuket Marine Biological Center (*ad hoc*); and AIT.

There are a number of recommendations for the training of trainers for implementation at the regional, national or subnational levels.

For the regional level, two options are recommended:

1. Establishment of an MPA Regional Training Center to train the trainers (three years); and
2. Module-based MPA training conducted in the different countries of the region by employing individual expertise for each module, or exchange of modules following the TRAIN-SEA-COAST concept.

Similarly, in-house trainings for trainers can be done at the national level and vocational and on-the-job training at the subnational level.

The group has also identified various follow-up activities that can be adopted such as: conduct of roving seminars; refresher courses; internships (exchange program for both the mid-level managers and field staff, e.g., park rangers); exposure/orientation of senior officials and immediate subordinates in the introduction phase of training program; inspector/controller/senior officials' site visits by way of providing for mentorship and dialogues; and use of the internet.

Working Group 2: East Africa and Indian Ocean

Assessment of training needs and current capacity

1. What are the needs for your region with respect to MPA training?

The emphasis has been placed on the mid-level managers. The group outlined a general definition of the management structure as follows where there is current management of MPAs: Sri Lanka employs protection through community-based special area management initiatives in the Hikkaduwa and Rekawa marine sanctuaries. The institutions involved in coastal and marine management are the Coast Conservation Department (CCO), Department of Wildlife

Box 1. Comparison between Kenya and Seychelles MPA personnel.

	Kenya	Seychelles
Senior Managers	Director Deputy Director Regional Assistant Director	Managing Director
Mid-level Managers	Area Warden Park Manager	Parks Officer Assistant Parks Officer
Field Staff	Park Ranger	

Conservation (DWLC) and National Aquatic Resource Agency (NARA).

In addition, specialized technical staff are responsible for partnership, biodiversity and tourism activities. The group identified the following MPA training needs based on this structure and mainly aimed at mid-level managers:

- MPAs of the world;
- planning conflict resolution;
- MPA planning stages
- negotiation in day-to-day management implementation;
- EIAs;
- marine ecology and ecosystems dynamics;
- community mobilization techniques;
- development of management plan;
- financial and business management;
- supervision and monitoring of MPA personnel;
- environmental monitoring techniques;
- crisis management (e.g., for oil spills);
- sustainable tourism management;
- basic computer skills;
- enforcement and prosecution procedures for MPA regulation violators;
- public education (and awareness);
- installation techniques for mooring buoys;
- basic scuba-diving skills; and
- development of action plan.

Field staff-level training needs covered the following issues:

- coral reef monitoring techniques;
- mangrove management techniques;
- basic seamanship;
- public relations;
- park interpretation;
- language skills;
- development of communication aids; and
- interpretation skills.

Standardized monitoring techniques should be followed in the region. A suggested reference is the *AIMS Tropical Survey Manual*.

It is suggested that training modules covering a selection of the above could be covered by integrating the training modules from the UNEP/EAS Technical Report Series No. 4 *Staff Training Materials for the Management of Marine Protected Areas* into the regional requirements and recommendations made.

2. What is the existing capacity for training managers in your region?

a. Naivaswa Wildlife Training Institute within the Kenya Wildlife Service is conducting project-related training programs covering:

- basic scuba diving;
- integrated coastal area management;
- basic mangrove ecology;
- mooring bouy installation and maintenance;
- mooring bouys users workshop;
- marine first aid, search and rescue techniques;
- basic boat handling and maintenance;
- basic computer skills enhancement; and
- bird identification.

b. The Seychelles has carried out in-house training courses (but does not have an institution) covering:

- basic scuba diving;
- firefighting;
- coral reef monitoring; and
- boat and engine maintenance.

c. Youth organizations, local tour guides and fishers in the Wichaduvum Marine sanctuary (Sri Lanka) have been trained in:

- first aid;
- participation in reef clean-up.

d. Regional workshop in marine turtle conservation

e. Seychelles and Sri Lanka have a few training courses/workshop/seminars on coral reefs, mangroves and coastal resources management.

Main priorities and gaps in the region

- environmental monitoring skills (standardized);
- business and financial management;
- allocation of funds for training purposes;
- networking in the region through visits to successful sites; and
- working visits by MPS staff to well-established MPS.

Training approaches and methods

1. Current approaches and methods for training mainly cover the following:

- in-house intensive training for one week with modules for 10-15 participants (60% practical and 40% lecture) followed by fieldwork; participants are assessed for possible future training;
- on-the-job training;
- normally these courses are performed twice a year for mid-level managers and one course per year for field level staff;
- mid-level managers occasionally get two-to-four-week external courses/study programs on park management, CZM, and marine ecology; and
- mid-level managers normally do not participate in practical diving, but occasionally participate in courses with the field staff.

2. On a regional scale, the training is mostly through learning by doing. Courses are generally very basic and irregular, which is considered a weakness. The experience with the in-house training in Kenya was assessed to be positive but should be expanded in scope and duration.

3. All training provided are done in-country.
4. Recommendations at the regional, national and sub-national levels:
 - expansion of training duration and content;
 - regional standardization of trainings modules;
 - additional training modules adapted to the national and sub-national context;
 - establishment of one or two regional institutes for specialized training in MPA management. Existing terrestrial park management institutes, such as the Tanzania Wildlife Institute, could be upgraded to provide MPA curricula development; and
 - establish efficient transfer of knowledge among MPA managers in the region.

Working Group 3: Caribbean

Needs of the region with respect to MPA training

The region is at different stages in the need for MPA management training. The number of individuals who would be involved in MPA management training exercises are very limited. This is due to the fact that although conventions have generally been applied to the Caribbean context so that there has been the declaration of MPAs, it would be erroneous to leap from that point to the training of MPA personnel. Many MPAs are not actively managed and are only at the declaration stage. Furthermore, there is a gap in the negotiation process involving all stakeholders which would lead to an identification of management regimes and therefore, training needs. The negotiation process required for the identification of management regimes to be employed in an MPA necessitates training for the individuals facilitating. Therefore, if a participatory process is followed whereby all stakeholders are identified and engaged in the dialogue concerning the management activities to be followed in the MPA, there must be training and/or enhancement of skills required for facilitating the process.

There are many parks that are lacking in management capacity. Awareness must be heightened as to the requirement to understand the continuous need to facilitate the participatory process. Training then for professional and technical staff will be centered around the mechanisms by which they can liaison

with stakeholders and the community. An operating question in understanding the foregoing is: 'how do we turn good scientists (who are usually managers in most MPAs) into good managers?' Most of the problems facing the management of MPAs in the Caribbean are socially derived, not of biological or physical nature. The impact communities have on the resource is greater than biophysical considerations. Hence, MPA managers require a suite of skills which will enable them to negotiate multiple use within the MPA while conserving the resource base. Furthermore, they must ensure that the agreements emerging from the participatory and consultative process are endorsed and sanctioned by government.

Training must occur at several levels. Firstly, training is required for individuals who will mobilize different sectors in the community. This must include professional and technical personnel within government as well as NGOs and community-based organisations, among others. Secondly, training of people at the community level is also necessary in order to assist in the ultimate management of the resource, especially if the individual(s) belong to user groups. The goal of the training exercise is to achieve a functioning MPA.

Skills and knowledge to be addressed in training programs

Prioritization of the needs for training is viewed as a complete package of skills to be implemented in phases. Phases listed include all of the skills required for the success of the process leading to the establishment of management regimes to be employed in the MPA.

Phase 1: Skills needed for planning and consultation leading to the establishment of the MPA

Target groups: relevant government officials, NGO and CBO staff.

- stakeholder analysis;
- resource assessment;
- environmental impact assessment;
- conflict resolution;
- participatory planning;
- community mobilization and strengthening;
- communication skills; and
- collaborative management.

Phase 2: Skills needed for management of MPAs:
Target groups: managers and field staff.

All of the skills and knowledge of phase 1 to be reimplemented, plus:

- financial management (including budget management);
- personnel management;
- revenue generation (e.g., user fees, grant proposals, private sponsorship and sales);
- strategic planning;
- resource monitoring;
- project planning and implementation;
- interpretation; and
- enforcement.

Tools required for phase I and II:

- case studies;
- training/course modules;
- role playing;
- methods manuals; and
- audiovisual materials.

Existing capacity

- Formal programs in the region (which are part of a university curriculum) are provided by:

The Consortium of Caribbean Universities for Natural Resource Management - course modules and instructional materials are provided to member universities for training;

University of the West Indies - MAREMP - Masters in Marine Resource Management; and

Centre Agronomico Tropical de Investigacion y Educacion - International Protected Area Management Course leading to a diploma.

- Informal programs (not part of a university program) are provided by:

CANARI- courses on co-management training principles, resource monitoring (wetlands/coral reef), revenue generation and participatory planning; and

UNEP - (1) SPAW (Special Protected Area for Wildlife) programs
(2) CENP (Caribbean Environmental Network Program)

Both programs provide training for managers.

- Ad hoc training

Internships in the region are provided by:

CANARI

National Estuarine Research Reserve (NERR)

Virgin Islands National Park

Marine Parks of the Netherlands Antilles

Other institutions within the region

- In-house training programs

There is no in-house training provided throughout the region except that which is provided by NERR and the US National Park Service. However, this training is restricted and not open to personnel from the region.

Gap analysis

There are sufficient trainers within the region and the capacity to implement training programs is not considered a problem. There is a need to add management skills to scientifically trained people currently managing MPAs. A recommendation is to attract professional managers for the operation of the MPA.

Working Group 4: South Pacific

Assessment of training needs and current capacity

The group's experience is based largely on the South Pacific Biodiversity Conservation Programme (SPBCP) administered by SPREP, Apia, Samoa. The SPBCP, funded by GEF and AusAID, has established 17 community-based conservation areas (CAs), 11 of which are now functional. Ten of these CAs are marine based, namely, Kiribati (2), Palau (2), Tonga, Korea, Tuvalu, Samoa, Solomon Islands, and Marshall Islands. The principle focus of a CA is the maintenance and enhancement of biodiversity. At present, they are not formally gazetted MPAs, although this may happen in the future.

Another well-established program is the Samoan government's Village Fisheries Extension Programme, an AusAID-funded project. A total of 52 Samoan vil-

lages have declared small marine protected areas in the lagoons adjacent to the villages. Thirty-two of these are now being managed by village committees and many of these have designated fish reserves within the MPAs.

The following assessment of training needs is based on the SPBCP Programme, but the framework may be easily modified to meet the needs of other managers of MPAs in the Pacific.

Box 2 is a generalized model of the management structure of the CAs under the SPBCP. The Conservation Area Support Officer (CASO) is the key to the successful implementation of the CA and as such is considered the mid-level manager (although much of the work may be at the field level). The model recognizes the importance of the heads of the local communities in the success of the CA and, hence, their position as upper level management. National governments and bureaucrats are outside the management structure of a CA. However, local representatives of government departments generally sit on the Conservation Area Coordinating Committee and provide technical input to the development of work programs.

CASOs have many roles in existing CAs, but their level of education and experience are very different. They may be expected to act as facilitators, technical advisers and sources of ideas and information. They are central to community acceptance of the CA concept.

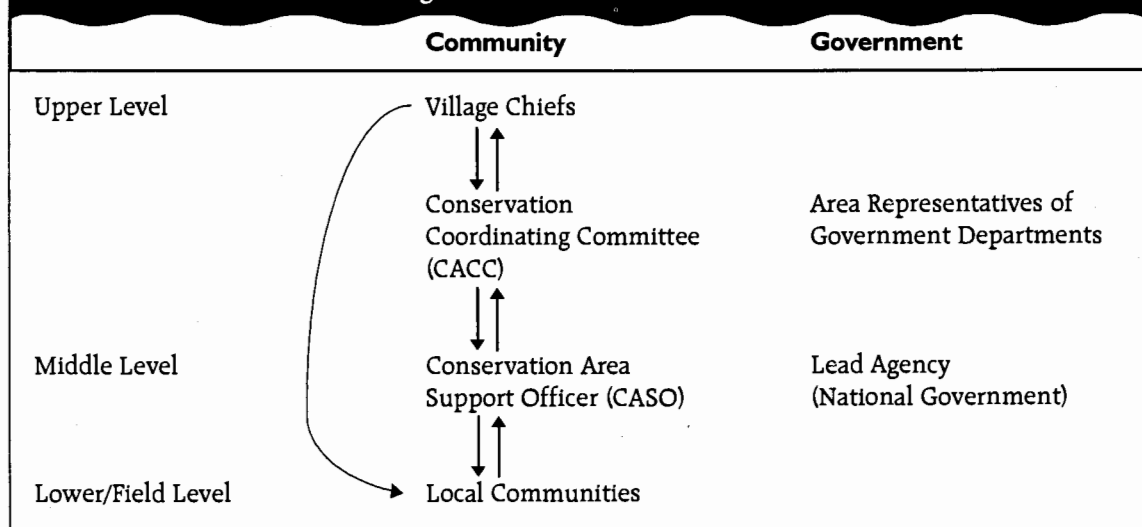
They need to be able to promote the project at all levels of the community and to develop community confidence in the concept.

In early 1997, the SPBCP conducted a need analysis for training programs required by CASOs (Box 3). This has helped provide the basis for the model that follows. It is important to remember that all CA-based training programs need to be developed in the context of existing social and cultural parameters. Extensive training is still required at a basic, introductory level, and specialist-training requirements will evolve or become apparent as the projects mature.

The need for advanced and/or specialist training for each level of the conservation area model was discussed at some length. The economic development of the communities and the consequent need for environmental protection will be integral to the success of the CAs and will need to be the focus of more advanced training. Courses required will evolve as the CA concept makes and takes a particular direction; e.g., a focus on eco-tourism as an alternative income source would lead to a requirement for courses focusing on business management training (feasibility studies, EIAs, project management), tourism marketing and promotion training.

The CASO would benefit from 'Train the Trainer' type courses as this would provide a means for further training within the community, particularly given the difficulties of cross-cultural training.

Box 2. Conservation area management structure.



Box. 3. Basic training needs for each level of the conservation area model.

Conservation Area Coordinating Committee (CACC)

1. Introduction to marine ecosystems and relevance to management, e.g., principles, components, local aspects and how they function.
2. Introduction to personal and management skills, e.g., leadership, communication, decision making, teamwork.
3. Introduction to tools of management, e.g., planning concepts, project management, community education and participation.

Conservation Area Support Officer (CASO)

1. Introduction to marine ecosystems and relevance to management, e.g., principles, components, basic biology, physical structures, relationship with land-based activities.
2. Introduction to personal and management skills, e.g., communication, leadership, decisionmaking, conflict resolution, team-building.
3. Introduction to project management skills, e.g., work planning, reporting, financial management, budgeting, office-based skills.

Communities

1. General introduction to marine ecosystems, e.g., what are MPAs; why establish them, their potential benefits; the community role, public education program to raise community awareness.

Existing training capacity within the South Pacific region

- Regional institutions and area of expertise

SPREP	-	environmental management
FFA	-	utilization of marine resources
SOPAC	-	coastal management issues
SPC	-	fisheries component
USP	-	marine science courses

Apart from USP, all organizations facilitate or run regional workshops on specific topics.

Australian and New Zealand institutions have a great deal of capacity for training programs and are members of the SPREP organization. Formal and specially designed training programs can be accessed on a needs basis, but funding by aid organizations is required.

- SPREP has commissioned a consultant to evaluate the training capacity of the region, excluding Australia. It is currently investigating the feasibility of a regionally based center (utilizing current organizations) to facilitate/coordinate training programs for CASOs. This may be later extended to other managers or students when resources become available.
- No designated MPA training institutions in the region.
- Current curriculum emphasis is not known. USP courses provide general coverage of marine and scientific principles, fisheries management and ecological processes.
- Trainers used at present are largely from Australia/New Zealand/USA but are generally selected from institutions currently working in the Pacific.
- The capacity to train existing managers within the Pacific nations is relatively small and most training is imported. Most regional institutions currently capable of training are fully occupied running student courses — a wider training role in a Pacific context is not practical due to lack of time and/or resources.

Training approaches and methods

1. Current approaches and methods used for training

Regional/ national	-	practical hands-on workshops emphasizing participation.
	-	intensive courses on specific topics.
Local	-	on-the-job training through contact with consultants.
	-	mentoring through volunteers working alongside national counterparts (CASOs).
	-	guidance/support/confidence building.
	-	practical skills/on-the-job training.
Regional	-	mentoring through follow-up by SPREP program officers (acting as mentors), providing support for CASOs post-training.



- National
- mentoring through in-country support provided by lead agency staff.
 - capacity raising programs of government departments through short or long-term projects involving external consultants.

2. Appropriateness of approaches

- Above programs are what currently work well in region.
- Any program involving extensive use of technical terminology/jargon is of limited value because of difficulty in translating into local languages and transferring information to local communities.

In the design of training programs, trainers/consultants/facilitators should remember that this may be a substantial barrier to the effective implementation of any program.

3. Group training at the regional or national levels has benefited CASOs. Training for CACCs/communities should be at the local level. Study tours by CACCs have provided a broader perspective on local issues and opportunities to exchange information and discuss problems.

Case by case consideration of attachment of personnel to institutions outside the region for longer term training.

Importance of group training of national government department representatives as a means of breaking down barriers between departments and promoting cooperation as well as exchange of information.

Session 2 - Working Group 1: Southeast Asia

Formulation of training modules

The group discussed the curriculum presented by Joop L.G. de Schutter and that of the manual on *Staff Training Materials for the Management of Marine Protected Areas* of RCU/EAS Technical Report No. 4. These curricula were compared to the identified training needs of mid-level MPA managers in the regions. Having scrutinized these three information sources, the group decided that the curriculum for mid-level MPAs in the region can be categorized into four ma-

ior categories, namely: I) Our Assets, II) MPA Management and Planning; III) Tools and Techniques, and IV) General Management Skills.

The contents of each major category are as follows:

I. Our Assets

- The nature of marine environment
- The sea as a place to live
- The sea as a large, dynamic system
- Use of and threats to the marine environment and its resources

II. Management Planning and Implementation

- Planning for marine protected areas
- Overview of marine protected area management (awareness building, alternative livelihood, hazard and risk management, park development, stakeholder involvement)
- Research and monitoring for marine protected areas
- Enforcement – legislative framework

III. Tools and Techniques

- Paralegal training (country specific)
- Monitoring
- Rapid rural appraisal
- Mapping
- Environmental impact assessments
- Information education campaigns
- Interpretation
- Cost-benefit analysis
- Resource valuation
- Search and rescue
- First aid
- Safety
- Scuba
- Special species
- Aquaculture techniques

IV. General Management Skills

- Networking
- Human resource management
- Leadership
- Financial management
- Accounting
- Computer skills
- Equipment and infrastructure maintenance
- Reporting skills
- Public relations

- Communication skills
- Logistics
- Income generation

This curriculum for mid-level MPA managers will be delivered in eight weeks spread over two years. To better ensure continuity of participants, this training will be done in each of the participating countries in the region. Certificates will be awarded to the participants. This will serve as additional incentives to the participants to pursue the training in the interest of career development. Lastly, the commitment of the participating institutions will be considered in the selection of training participants.

The course for mid-level marine park managers will employ a 60-40 lecture and hands-on teaching methodology with emphasis on hands-on or field methodologies.

A training program on 'Training the Trainers on MPA Management' will serve as the uniting element in the region for MPA management. Apart from the topics listed for mid-level MPA managers, the course on 'Training the Trainers on MPA Management' will include the following adjustments:

V. Teaching Skills

- How to teach? or didactic principles
- Assessment of target groups
- Methods and principles of learning
- Tools for learning

The course on 'Training the Trainers' will have two phases, namely, 1) an intensive three-month course on the concepts and skills of MPA management, and 2) a two to three-month internship in an established MPA in or outside the region.

Inventory of materials and tools

The group identified various materials which can be used in a MPA course and which are available in many institutions in the region. These materials are in the form of books, manuals, pamphlets, posters, slide series, VHS, newsletters, journals, technical reports and internet webpages. What is needed in the region is a clearinghouse for these materials. Several organizations were identified which could act as possible clearinghouses, i.e., WWF, UNESCO and IUCN.

As regards the materials and tools which need to be developed, the group identified the following:

- Specific manuals;
- Module specific syllabi;
- Training materials similar to the PADI modular structure which include coordinated lecture notes, slide series, trainees' manuals, exercise books, teachers' manuals, simulation tools and performance tests; and
- Internet back-up for distance learning, networking and open forums

Recommendations

The group recommended the following actions to be undertaken for the development of MPA programs in the region:

- Provide information about existing clearing houses;
- Establishment or identification of an existing network for MPA concerns; and
- Preparation/packaging of a proposal on:
 - support for secretariat for a regional MPA center,
 - development of cases (MPAs), and
 - training material for MPA course.

Working Group 2: East Africa and Indian Ocean

Formulation of training modules

After reviewing the existing list of training needs aimed at mid-level managers and field staff, the group clustered each subject of the proposed modules. Some of the subjects were too broad with respect to the difference in their objectives and approaches. These had to be split up and modified for incorporation into the appropriate modules.

In spite of the fact that our focus was mainly on park managers (mid-level managers), we found that most of the training needs identified for the park rangers (field staff) directed us to add a sixth element to the proposed modular structure (refer to Box 4).

Inventory of materials and tools

Some materials, mainly training manuals, have been produced at the local level and are directed to field staff, e.g., Seychelles has produced manuals on law enforcement, surveillance and conflict resolution, conservation interpretation and public presentation, boat handling and safety at sea.

In the case of Kenya, despite training being carried out on a regular basis, no manuals have been produced. The courses are delivered from lecturer's notes. The available materials are from established institutions and international organizations such as the ASEAN/AIMS Manual on Coral Reef Survey Methods, diving manuals and first aid manuals.

Manuals and tools that should be developed

- Manual dealing with basic marine ecology and life cycles
- Standard format on coastal communities survey questionnaires
- Develop curricula for modules which have been identified and from these develop appropriate training manuals. It was suggested that a curriculum

development expert within a reputable educational institution should undertake this process

- Electronic networking within the region - access to information reports, publications, on-going projects, problem sharing

Recommendations

- Role play - computer module.
- Case studies/books (problem solving).
- Identify a strong competent institution to implement the training programs.
- Establish a reference group that will monitor the outcome of this workshop.
- Refresher courses and/or alternative methods of evaluating the effectiveness of the training program after three to four years from the date of training.

Box 4. Training needs clustered in appropriate modules^a.

Module headings	Subject preferably identified as training needs	Duration
Module 1 Selection of criteria and problem analysis	<ul style="list-style-type: none"> • Conflict resolutions 	1 week
Module 2 Sociopolitical issues and legislation	<ul style="list-style-type: none"> • Negotiation techniques • EIA – new subject which was identified and considered important for mid-level managers' training 	
Module 3 Marine ecosystems	<ul style="list-style-type: none"> • Marine ecology and ecosystems dynamics 	2 weeks
Module 4 Marine protected areas management and planning	<ul style="list-style-type: none"> • Community mobilization techniques • Development of management plans • Financial and business management • Supervision and monitoring of personnel • Environment monitoring techniques • Crisis management • Sustainable tourism management • Basic computer skills • Development of communication aids 	2 weeks
Module 5 Implementation and monitoring	<ul style="list-style-type: none"> • Enforcement and prosecution procedure for MPA regulation violators/surveillance • Public education awareness • Basic scuba diving skills • Installation techniques of mooring bouys • Basic seamanship • Coral reef monitoring techniques • Mangrove monitoring techniques 	2 weeks
Module 6 Park interpretation and communication skills	<ul style="list-style-type: none"> • Skills in public relations • Language skills • Interpretation skills 	1 week

^aModule presentation: 60% practical, 40% theory.

Working Group 3: Caribbean

Formulation of training modules

Coastal and marine ecosystems:

- overview of ecosystems
- resource assessment
- overview of resource monitoring
- ICZM

Target: all groups

Duration: 2 weeks

Priority: regional

Participatory planning:

- stakeholder analysis
- conflict resolution
- community mobilization
- collaborative management
- communication skills

Target: all groups

Duration: 2 weeks

Priority: regional

MPA planning

- selection criteria
- guidelines for establishment
- resource mapping
- mapping of uses and impacts; identify conflicts
- zoning
- consultation
- management plans and agreements

Target: all groups

Duration: 1 week

Priority: regional

Management skills:

- financial management
- personnel management
- revenue generation
- project planning
- interpretation of rules and regulations
- enforcement
- resource interpretation

Target: managers and field staff

Duration: 2 weeks

Priority: local

Monitoring of resources and uses to answer two basic questions

- do restrictions result in desired protection of resources?
- are permitted uses sustainable?

- collection of visitor/user statistics
- water quality monitoring
- user impact monitoring
- monitoring of selected species or groups of species (e.g., reef fish)

Target: managers and field staff

Duration: 1 week

Priority: local

Working Group 4: South Pacific

Target Group: CASOs

Formulation of training modules

Introduction to Management of Marine Environments

- What is an MPA
- How are they chosen - criteria for establishment
- Why have them
- Concepts and terms, approaches in management
- MPAs as strategy for protection
- International, regional, local context
- Cross boundary issues

Community-based management

- PRA/RRA methodology
- Social/cultural/political issues
- Legislative aspects
- Traditional systems of management
- Gender/equity issues
- Campaigning, community education, awareness raising

Introduction to marine ecosystems and relevance to management

- Basic ecological and physical processes
- Land/sea interactions
- Human impacts on coral reefs, mangroves, seagrass, wetlands

Organizational management skills

- Project management, e.g., computing, reporting, staff management, budgeting, work planning, office-based skills, financial management, contract management
- Personnel management, e.g., communication, leadership, decisionmaking, facilitation, negotiation, conflict resolution, presentation, team building, managing time, public relations

Tools for MPA management

- Preparation and planning, e.g., data collection, database development, questionnaire design, community mapping, zoning concepts, GIS, remote sensing, training, SOE indicators
- Implementation and monitoring, e.g., field surveys, data collection, enforcement, extension and public education, EIA, interpretation
- Management review, both internal and external, e.g., SOE reporting, programme review, evaluation

Teaching, methodology and timeframe

- Use of case studies to apply techniques as part of learning process, particularly if it has relevance to trainee
- Module 1 1 day for basics (2 days if legal history/implications are included)
- Module 2 2 days (introduction); 1 week (advanced)
- Module 3 3 days (introduction); 2 weeks (advanced)
- Module 4a 5 days (introduction); 3 weeks (advanced)
- Module 4b 5 days (introduction); 2 weeks (advanced)
- Module 5a 5 days (introduction) 1-2 weeks for each component (advanced)
- Module 5b 5 days (introduction) 1-2 weeks for each component (advanced)

- Module 5c 2 days (introduction)

- use of distance education as tool for expanding basic courses
- 28 training days required for introductory course

Inventory of materials and tools

- No current formalized training course/materials for marine protected area managers in Pacific regions except for training courses offered by some Australian universities and the GBRMPA. Lots of reference materials covering fish, corals, invertebrates are available as support tools.
- Training manuals/reference materials based on suggested training modules.
- Videos are valuable tools but expensive to produce. However, they can quickly take a message to a large audience

Recommendations

- As a preface to questions posed in this section, suggest nomination of one regional representative to collate and document all existing materials and tools.
- Once this is done a materials needs analysis can be done on a regional basis; this will also allow cross-regional access to existing resources.
- CZMC to catalogue information available through WCMC (World Conservation Monitoring Centre).

Session 5 - Working Group 1: Southeast Asia

Box 5. Ways institutions can participate in future MPA training programs (hands-on training only).

Way	ICLARM	MSI	AIT	LIPI	WWF-P	HARIBON	TMSI	RECOFC	CORIN	IIRR	SEARCA
Conduct of needs assessments	X			X		X		X	X	X	
Designing of training programs	X	X	X	X	X	X	X	X	X	X	X
Development of case study and other training tools	X	X	X	X		X	X	X	X		X
Conduct of training of trainer programs	X	X	X	X	X	X	X	X	X	X	X
Delivery of training	X	X	X	X	X	X	X	X	X	X	X
Networking of training news/ programs	X	X	X	X			X		X		X

Box 6. Areas of expertise of institutions in the region.

Name of Institutions	Area of Expertise
ICLARM (International Center for Living Aquatic Resources Management), Philippines	Networking, fisheries resource assessment, database development, community-based resource management
MSI (Marine Science Institute, University of the Philippines, Diliman), Philippines	Reef study, marine ecology
AIT (Asian Institute of Technology), Thailand	GIS, remote sensing, mapping
LIPI (National Institute of Science), Indonesia	Education, curriculum design, networking
WWF - Philippines (Kabang Kalikasan ng Pilipinas), Philippines	Interpretation material, community-based management
Haribon Foundation, Philippines	Education, curriculum design
TMSI (Tropical Marine Science Initiative), Singapore	Marine ecology, curriculum design
RECOFTC (Regional Community Forest Training), Thailand	Negotiation skill, community support
CORIN (Coastal Resources Institute Centre), Thailand	Integrated management
IIRR (International Institute of Rural Reconstruction), Philippines	Upland and coastal community-based training
SEARCA (Southeast Asia Regional Research Center for Graduate Study and Research in Agriculture), Philippines	Networking, negotiation skills

Recommendations

- Motivate/create commitment from related agencies for the continuity of training program and provide incentive-based training.
- Set up and maintain the network.
- Widely disseminate and produce materials/documents and other training media (e.g., manuals, guide books, slide series, audiovisuals, case studies, computer-based learning).
- Call in expertise from abroad.
- Involve partnerships in programs.
- Conduct training for trainers within the region concurrent to permanent national level training programs.

Networking

The existing network can fulfill the need for linking MPA managers. However, in some countries, e.g., Thailand, translation into the local language is very important. The following list shows the names of existing networks. However, there is a need for funding support for enlarging the scope of these:

- Existing networks

1. NETTLAP: UNEP's Newsletter
2. LAUT: ASEAM's Newsletter

3. International Coral Reef Initiative (ICRI)
4. Naga, the ICLARM Quarterly
5. SEARCA
6. Coastal Environment Education for Practitioner in Asia Pacific (CEEPAP)
7. South Pacific Regional Environmental Programme (SPREP)
8. World Commission on Protected Area (WCPA), IUCN's Commission
9. Wetlands International

- To make the networks self-supporting and sustainable over the long term, these are possible actions:

1. Generate income from training course, publications, manuals, books or souvenirs.
2. Initiate a system which requires the country member in the region to pay some of their MPA income into the operation of the network.
3. Seek funding from the private sector which benefits directly from MPAs.

Priorities for action

If funding is available, these are the three projects which should be undertaken in the next year:

1. A regional training program

Funding should be sought to conduct a comprehensive feasibility study of the training programs (where, how, how long and who).

2. Strengthening/structured mechanism for accessing relevant information source (clearing house). There are three suggested activities:

- Improve the capacity or mechanism of the existing relevant network with use of seed money, e.g., NAGA, IUCN Newsletter;
- Encourage an individual commitment to link with other people in the region and within the country; and
- Establish a formal national focal point with committed office/staff from every country in the region. Support the staff in distributing information to his/her MPA managers.

3. Support/sponsor postgraduate students in each country to carry out a comprehensive survey (lessons learned) of his/her own country's MPA management. These studies could focus on:

- legal status
- enforcement
- paralegal aspects
- training needs
- people participation program
- public awareness program

Working Group 2: East Africa and the Indian Ocean

The role of institutions in future MPA training programs

Curriculum Development. MPA-related training can be provided on three levels which are academic (integrated coastal zone management), park management and ranger training. ICZM courses can produce researchers and teachers with skills necessary to train park managers and implement 'training of trainer' schemes and these trainers can be involved in actual MPA managers training and curriculum development. Curriculum development requires inputs from three levels:

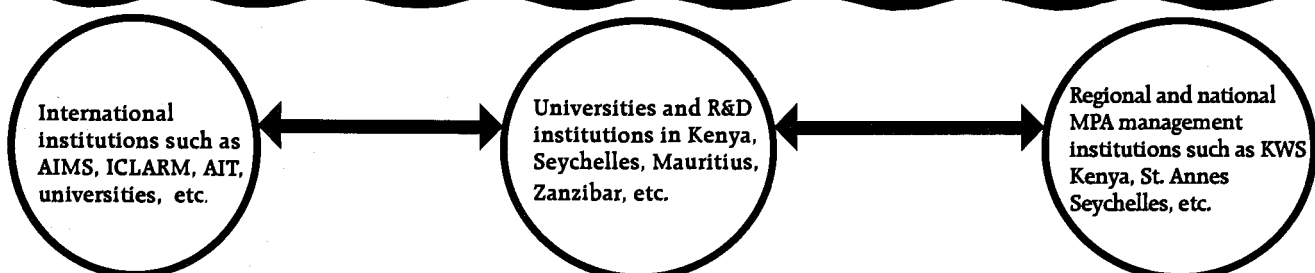
- International generic (drawing on the capacity of known international institutions)
- Regional academic (drawing on the capacity of local universities and research institutions)
- MPA management institutions (sub-regional and local institutions)

The East Africa and Indian Ocean region has only very few institutions that would possibly qualify for participation in a program for curriculum development in the future. Mentioned are:

- International Ocean Institute Operational Centre at Chennai, India (offering courses in ICZM and Seabed Mining);
- Naivasha Wildlife Training Institute (institute owned by KWS. It is planned to start a marine department in Malindi offering MPA management training);
- Proposed St. Annes Marine Research Center (ODA financed project) and (or in combination with) the UNEP recently-established Regional Co-ordination Unit in the Seychelles;
- Zanzibar Marine Science Institute; and
- EU-COI (Indian Ocean Commission) project in Mauritius (center of a EU financed regional project).

To develop capacity for MPA training in the region is very country specific and a collaborative training involving East Africa and South Asia is impossible. Therefore, the CNPPA (IUCN) subdivision should be maintained. The area under consideration in this report is only East Africa.

The institutions mentioned in Kenya, Seychelles, Mauritius and Zanzibar are not capable of playing a role in curriculum development for MPA management under the present conditions. Capacity development through assistance from reputed international institutions is needed. It is necessary to establish close co-operation for combined curriculum development and capacity development between the international institutions and academic institutions (universities and research institutions) in East African countries (international co-operation) and between these academic institutions and regional training centers (regional co-operation). The process is illustrated in Box 7.

Box 7. Interaction of institutions in curriculum and capacity development.


Role in Curriculum Development. In the development of curricula and training materials, institutions play a role in their own right depending on experience and on their relationship with the target group.

Very strong communication links should be established during the process. Box 8 presents an overview based on earlier assessed needs.

Box 8. Training module and implementing institutions.

Training Modules	Subjects			
		International institutions	Regional R&D institutions	Regional and local MPA management institutions
Module 1 Selection of criteria and problem analysis	<ul style="list-style-type: none"> MPA selection criteria Conflict resolution/problem analysis Case studies 	○ ○	○ ○	○
Module 2 Sociopolitical issues and legislation	<ul style="list-style-type: none"> Negotiation techniques EIAs Legislation Case studies 	○ ○ ○ ○	○ ○ ○ ○	○
Module 3 Marine ecosystems	<ul style="list-style-type: none"> Marine ecology and ecosystems dynamics 	○	○	○
Module 4 MPA management and planning	<ul style="list-style-type: none"> Community mobilization techniques Development of management plans Financial and business management Supervision and personnel monitoring Environment monitoring techniques Crisis management Sustainable tourism management Basic computer skills Development of communication aids 	○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○ ○
Module 5 Implementation and monitoring	<ul style="list-style-type: none"> Enforcement and prosecution Public education/awareness raising Basic scuba diving skills Mooring buoys installation techniques Basic seamanship/boat handling Coral reef monitoring techniques Mangrove monitoring techniques 	○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○ ○ ○	○ ○ ○ ○ ○
Module 6 Park interpretation and communication	<ul style="list-style-type: none"> Public relations skills Language skills Interpretation skills 	○ ○ ○	○ ○ ○	○ ○

○ - Lead institution

○ - cooperating institution

Timeframe: Capacity development and development of curricula and training materials require long-term commitment. It may take more than two years before results of the efforts are visible in the MPAs, even under the assumption of minimum scenarios. In view of the present status of readiness of the institutions in East Africa, the following estimate can be made:

Capacity development and development of training material (including start of the actual setting up of the institutions)	1998 onward (1-2 years)
Training	6 months
Implementation	—
Evaluation	—

Networks: Networks are seen as absolutely necessary for the start and onward functioning of MPA management institutions and institutions linked to MPA management. The structure could be that somewhere (e.g., at the proposed KWS Naivasha Training Institute Marine Department) the initiative is taken to establish a regional secretariat which is going to develop the network. The secretariat (the East Africa Regional Seas Network) should be kept as small as possible. It is unlikely that members (network nodes) are going to be willing to pay much for its sustainability (costs of the services of the secretariat). A minimum package could be:

- Setting up and maintenance of the network (keep regular exchange of information going and function as mailboxing);
- Bringing MPA training and management capacity together (course participants, trainers, teachers, researching);
- Organizing or facilitation of meetings and workshops; and
- Fundraising or facilitation of fundraising.

Members of the network will be MPA management institutions, universities, R&D institutions, NGOs, etc.

Minimum Intervention: With regard to recommending a minimum intervention under the assump-

tion that funds would be available, it is thought that in view of realization of the defined long-term objectives this makes no sense. Capacity development and development of curricula and training needs, including maintenance of that system through organization of refresher courses and operation of a communication network, are typically long-term activities.

In response to the request for ideas for short-term (one year) interventions, two types were mentioned:

1. Establish the East Africa Regional Seas Network

This is a very useful first step towards future capacity development for MPA management. Possible terms of reference are:

- Set up a focal point (secretariat) in the region (minimum infrastructure would include two staff (academic level), well-established telephone connection, computers, modems, etc.) and networking skills;
- Make a detailed inventory of existing capacity for MPA management curricula development in the region;
- Make a detailed inventory of training needs for MPA management in view of existing and planned MPA management institutions; and
- Structure training needs into a coherent proposal for MPA management training in the region.

This project will lead to a list of institutions involved in MPA management and a plan and approach for MPA management training. It will bring institutions together and function as an initiative for MPA management training development and coordination in East Africa.

2. Organize short-term training in MPAs (Ranger level)

From the table (local focus) possible examples can be derived. Mentioned were:

- Mooring buoys training
- Diving skills
- Basic seamanship

For each training an existing institute would take the lead and develop training material with selected regional and international institutions on an ad-hoc basis (similar to example of recent University of Rhode Island mooring buoys training in Kenya).

Working Group 3: Caribbean

Institutions which can participate in training programs

- CANARI, CCUNRM, UWI/MAREMP and selected NGOs in the region can conduct needs assessments; design training programs; develop curricula and materials; and deliver training. Areas of special expertise include:

CANARI - co-management, marine resource monitoring (reefs, wetlands, artisanal fisheries), revenue generation

CCUNRM - curriculum development, teaching

UWI/MAREMP - marine ecosystems, ICZM

NGOs - practical MPA management experience

- CANARI and CCUNRM can identify and contract experts in the region to develop case studies and other training tools.
- CCUNRM can conduct training of trainers.

Enhancing training capacity

- Training capacity can be best enhanced by strengthening the institutional framework of existing institutions for delivering training.

Networks

- Existing CCUNRM network is the most useful for developing MPA training programs.
- No new network should be created.
- CCUNRM network can be improved by establishing more linkages with NGOs in the region.
- Information access can be improved by creating a home page for CCUNRM.

Priorities for action

- Developing and testing of three training modules (coastal and marine ecosystems, participatory planning, and MPA planning) directed to all target groups. This includes:
 - Development of the training modules, review by experts, preparation in final format for field testing, preparation of case studies; translation of materials in English or Spanish (duration: six months);
 - Identifying participants from target groups for field testing exercise (max. 10 per training module);
 - Selecting site for field testing exercise on the basis

of characteristics relevant to the module, while taking into account differences in size of the islands and language differences;

- conducting field testing of training modules (three modules for two weeks each over a three-month period);
- Participants' evaluation of training modules; and
- Follow-up of field testing, revision of modules and preparation of final training modules (duration: two months).

Total activity will require 12 months.

- Developing and testing of two training modules (management skills and monitoring of resources and uses) directed to MPA managers and field staff.

This activity includes the same steps as the activity under priority a, but the target group is different and the field testing will have fewer participants.

Working Group 4: South Pacific

How can the institutions in the region participate in future MPA training programs?

In answering this question, the group referred to a recent initiative between SPREP and the ICPL which, when completed, will provide an answer to this question.

SPREP and ICPL are currently investigating the possibility of setting up a regional center for protected area training in the region. A Memorandum of Understanding has been signed (September 1997) between the two organizations based on current expertise and capacity and forms the framework for collaboration on this project. A consultant will soon be recruited to carry out the following tasks:

- Consult regional institutions regarding their interest and capacity for MPA training;
- Identify/negotiate with an institution which will serve as the center for PA training in the region;
- Identify gaps in information/training material;
- Prepare a training program for the region; and
- Identify institutions best equipped to deliver training.

The consultant will also be required to investigate the feasibility and practicality of distance learning and, if considered appropriate, how it can be effectively implemented.

It is expected that the five training modules developed for the South Pacific Region during this workshop will serve as starting points for discussion between the consultant and regional institutions with regards to the content of a PA training program for the region.

How can training capacity within the region be enhanced?

The first priority is to set up a training center as discussed above. Other requirements include:

- Funding support;
- Establish a web site for dissemination of information;
- Develop a training for trainer's program; and
- Publish and distribute information through a newsletter.

Networks - are they useful?

The general answer is yes, they are useful, although this sometimes depends on the individuals involved in the network.

Are there existing networks which can be used or is a new/special network needed? Some networks already exist and some of them are in need of financial support to make them more effective.

SPREP has recently received a mandate from its member governments to set up a network of PA practitioners and organizations involved in MPA development in the region. It is expected that regional training institutions will also participate in this network.

The main considerations for making networks self supporting and sustainable over the long term are:

- The usefulness of the network;
- Support of host organization; and
- The availability, commitment and dedication of the person doing it.

Priority short-term activities for 1998

- Refer to South Pacific recommendations from Session 2.
- Funding support for the development of the SPREP/ICPL initiative as outlined in QI.



A framework for future training in marine and coastal protected area management

J.W. McManus, G. van Zwol, L.R. Garcés and D. Sadocharan, Editors. 1998.

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